The Builder.

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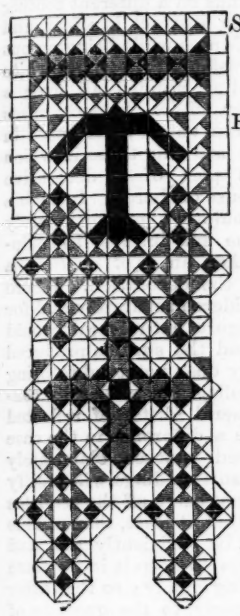
ILLUSTRATIONS.

New Town-hall for Dover.—The late William Burges, A.R.A., Architect 43
Proposed Church, Westgate-on-Sea, Thanet (Double-page Engraving).—Mr. C. N. Beazley, Architect 46
Sanatorium at Reedham (Plans, 53).—Professor T. Roger Smith, Architect 48
St. Mary's Catholic Church, Croydon, Altered and Enlarged (Double-page Engraving).—Mr. F. A. Walters, Architect 50, 51

CONTENTS.

Sculpture, Architecture, and Colour 35
"The History of Freemasonry" 37
Something about Sandgate and its Convalescent Home 39
Strength of Materials 40
Bramshill 41
The Burning of the Rathhaus Towers at Aix-la-Chapelle 41
Light and Air 42
International Exhibition at Nice 42
The Institution of Civil Engineers; Premiums Awarded 42
Dover Town Hall 57
Proposed Church, Westgate-on-Sea 57
St. Mary's (R. C.) Church, Croydon 57
The Sanatorium at the Reedham Asylum for Fatherless Children 57
The Principles of House Drainage: Parkes Museum 57
The late Mr. C. H. Stock 58
The Pointing of Rubble Walls 58
Fine Art Exhibition and Technical Schools at Halifax 59
Extensive Works at the General Post Office 59
Rebuilding the "Cock" Tavern 59
Cricket Match, between the Students of the Royal Academy of Arts, and St. John's Wood Art Schools 59
The City of London College 59
Westminster Jews' Free Schools 59
Foreign Notes 60
Fire Insurance in Berlin 60
Practical Education 60
The New Railway Station and Bridge across the Thames at Blackfriars 61
The Engineering and Metal Trades' Exhibition 61
A Public Winter Garden and a Theatre at Eastbourne 61
Provincial News 62
Scotch News 62
The Extra Scale of Payment for Overtime 62
School Board Contracts 62
Fireproof Floors 62
Protection from Fire 62
Flues 62
Old Meeting Trust, Birmingham, Church, &c., Competition 63
Building Patent Record 63
Light and Air Case: The Patent Silvering Company *v.* R. H. Padbury, W. C. Wayre, and H. Burman 63
Admissions to the Royal Academy of Arts 63
Church-building News 63
Dissenting Church-building News 63
Books: Church's Precious Stones (Chapman & Hall); Scott's Draining and Embanking (Lockwood); Tramway Acts (Stevens); The Joiner and Cabinetmaker (Houlston); The Land of Morgan (Whiting) 63
Variorum 64
Miscellanea 65



Sculpture, Architecture, and Colour.

THE account which we published two or three weeks ago as to the experiments which had been made by a German sculptor, Herr Cauer, with the view of arriving at a better understanding in regard to the process by which the Greeks coloured their sculpture, seems to indicate, as was then observed, the probability of a revived interest in the discussion of the question of colour in Greek sculpture, as well as that of the principle of colouring sculpture generally. The subject has a direct bearing, also, on certain sources of architectural effect and expression.

In regard to sculpture considered separately, there are two theories or systems on which colour may be applied. It may be done either with the view of producing realism in flesh tints and costume, or merely with the view of producing a softened and more harmonious effect, or of getting rid of the too great coldness of uncoloured stone or marble, without any attempt at realism. This latter form of colouring may be carried out on three different systems. It may consist of a colouring of the entire surfaces of a figure, both flesh and drapery, with tints or tones much less pronounced than those of a real figure or of real draperies, but having the same kind of ratio to one another, in character and strength of tone, as would be the case in a living figure, forming a kind of suggestion of realistic colour in a much lower and quieter key; or the colour element may take the form of a special decorative treatment, in a tolerably marked manner, of some of the adjuncts of the figure or of the costume, such as gilding applied to the outline of the drapery, or a gilded fillet in the hair of a Ceres perhaps, or a gilded spear and sword in the hand of a warrior or of a warlike god, a Mars or a Pallas. Such accessory decoration has the effect of brightening up the whole, if of white marble, without detracting materially from that purity and simplicity of artistic expression which is generally considered to belong to marble, and without in any way spoiling the lustre and semi-transparency of the surface, which is in this case supposed to be left untouched except at salient points. There is the third method, of not touching the actual figure with either colour or gilding, but placing it against a background of colour in order to relieve and throw out the more the pure and colourless marble, which is, at present, the most accepted material for high-class sculpture.

As to the realistic colouring, there is, as all artists will agree, but one thing to be said; it is and always must be wrong: for two main reasons, in themselves quite sufficient, without mentioning other subsidiary ones. In the first place, the object of sculpture is to idealise, to present in palpable form an abstract ideal or thought of the sculptor. The labour and costliness of the art are not worth undertaking for the sake of mere imitation of everyday life. The vulgar piece of coloured realistic sculpture now in the Royal Academy, and on which we have before commented, is an example of this; it is undoubtedly clever in execution, which has been the excuse for its admission, but it is cleverness and costliness of work bestowed on an object which we feel to be utterly unworthy of so much pains. The other reason is that in attempting realism we are attempting what it is palpably impossible to carry out in the materials and with the methods used in sculpture. The very fact of the solidity of modelled form in sculpture emphasises the impotence of the colourist to convey anything like an adequate imitation of nature. In painting, we have not the round form, with its actual solidity of proportion, to betray any one into looking on the work as an attempt at absolute and deceptive realism. The painting is executed on the flat, not in the round; and what it does attempt, the realisation of the delicacy of colour in nature, is attempted with a medium capable of very delicate manipulation, and having a surface with something of the soft texture of nature. Even so, however, a painter would be convicted of a certain vulgarity of imitation, and of a failure to achieve what he aimed at, if his canvas could be suddenly changed from a flat surface to a round, or a model, retaining the same characteristics of execution. Some kind of conventionalism we must have in art, because it is fatal to come into actual rivalry with the realism of nature; the artist in endeavouring to do so is at once convicted of presumption and failure: and this even more strikingly if he attempts to convert the rounded modelled form of the statue into a realistic imitation of nature and of drapery. Far more full and minute imitation of the texture and colour of the reality would be here required to give anything like success, because the solid imitation of form by the modelled figure calls attention the more emphatically to the attempt to realise; while at the same time the means at the artist's command are less tractable and less capable of delicate manipulation than those which can be used in painting on canvas on the flat. The surface of the marble, for instance, is hard, its texture smooth; it cannot with any colouring present any real imitation or rivalry of the softness of nature. The artist would be overcome by the comparatively unimportant detail of the hair at once, to begin with. He can produce in plain marble a treatment of hair which may be fine and effective as a translation of hair into sculptural treatment;* but let him once put realistic colour on it, and his sculptural treatment will be a horrible travesty, provoking even laughter. An attempt at realism in that direction can only end in affixing real hair to the head of the statue, giving it a wig. Let the artist go on from that, and he will find it necessary to have real drapery, not to make the hair seem too flimsy and light. Let him proceed to colour the face and other exposed portions as realistically as he can, and he will arrive at presenting us with something which, however fine in conception, will have about the same relation to the nature which it claims to imitate as a waxwork figure, save that the waxwork will probably be the best imitation of the two. The idea of the figure may be very fine, very poetic even; but the contrast between the actual life and the attempted imitation will force itself upon the spectator so strongly that all admiration for the sculptor's conception will be lost in derision for the futility of his attempted imitation of nature.

This method of treatment, in fact, is only practised in modern civilised countries by vulgar artists for vulgar people ("wax-works" representing the most common form of this sort of art); and when practised by the best artists of a period in their best efforts, usually seems to mark a half-civilised period,—a semi-barbaric state of taste. How tawdry the effect of such treatment is we were practically reminded at the recent "Tale of Troy" performance, where a realistically-draped and highly-coloured image of Athene was introduced in a shrine in one of the scenes, forming a curious contrast with the living draped figures on the stage. That the Athenians of the great Classical period attempted any such realism with their great statue in the Parthenon we do not for a moment believe, though there is little doubt that the statue was gorgeously decorated in one way or another; precisely how, we do not and never can know now. But in that case it may be said that religious superstition operated as well as artistic perception; and the sacred statue might very probably be decorated in a manner to satisfy the superstitious feelings of the people rather than the purer artistic light of Pericles and Phidias, and their intellectual peers. That statue may be therefore regarded as an exceptional case, not coming within the strict limits of the question as to the manner in which the Greeks applied colour to their architectural sculpture. But how did they colour

* This has its limits, however. The attempt made once or twice to treat a Skye terrier in sculpture has only resulted in giving the idea of a jagged mass of marble; and the sculptor of a bust of an eminent man who had thin, slight whiskers (exhibited at the Academy some little time since) was so troubled as to the treatment of the whiskers that he got out of the difficulty by omitting all indication of them,—thereby, however, greatly impairing the resemblance to the original.

the frieze and the metopes? That is the question of more immediate interest. That they did colour them is, of course, beyond question now; and more, one may say that the idea that the frieze was coloured, so as to throw it out with tolerable brilliancy, affords the only explanation hitherto of the fact that the builders of the Parthenon should have placed so beautiful a piece of sculpture in the position which it occupies. If without colour,—if merely carved, as used to be supposed, in the plain marble, that low relief must have been almost lost in the position assigned to it, at the top of the *cella* wall and under the shadow of the colonnade roof. We are certainly not prepared to come to the conclusion, without further proof in the way of facts (so hard to come at now), that Herr Cauer's theory of a general ground of gilding with the special colours overlaid on it, represents the actual facts of the case. That it would have a very good effect, soft yet brilliant, we are quite ready to believe; but it is a somewhat roundabout process, the belief in which is based on rather roundabout reasoning; and it strikes us on the whole, though very interesting and ingenious, as being a little too clever to be quite probable. Besides, the theory of the gold ground might be accepted or rejected without affecting the question what degree of colour was applied and what degree of colour effect was intended. Herr Cauer's suggestion is one of process rather than of principle. But in regard to the principle adopted, our impression would be that it would probably be a union of the first and third methods of conventional colouring which we suggested above: a union of rather low-toned local colour, realistic in relation of tones, but not in actual tones, with a tolerably strongly-coloured ground to throw the figures out into relief, and render them properly apparent in the subdued half-light in which they were placed. That the figures were painted with realistic flesh colour, the horses likewise in natural colours as well as the dresses of the riders, as shown in Mr. Tadema's painting of Phidias exhibiting the work to his friends before the scaffold was taken down, we cannot believe. If it were so, we should say that the Greeks for once made a mistake, and spoiled their own beautiful work by vulgarising it into a kind of picture in relief. The absence of any indication of bridles in the carving, though the hands are carved as in the act of holding them, does suggest the idea that the bridles may have been inserted in gold laid upon the surface of the carved work; an idea which is not very happy, and would be called barbaric if not done by Greeks: but gold is one thing, colour another; and the existence of the gold would not in itself necessitate the employment of very strong and realistic colours in the other portions. The strong background (of dark blue?) would be practically necessary to throw out the design as seen from below; but there was no such practical necessity for realistic colouring in detail and in strong colours, and we cannot believe that this could have been resorted to. We may instance, as a practical reason against such a belief, the want of any definite or strongly-marked remains of colour on the sculptures themselves. With great difficulty, and by the closest observation, faint traces of what may be gold stains, which may be the remains of colour, can be made out on them; that is all that the naked eye can detect on the slabs that now hang on the wall in the British Museum. But go up to the Greek vase-room, and look at the group of little figures from Tanagra,—of probably nearly the same age as the Parthenon work; there is no difficulty or doubt about those little figures. They were coloured like dolls almost,—possibly were made for some such purpose. The colour still remains strong upon them in many places; no faint suspicions, no "traces of colour," just discernible with a microsccpe or on chemical analysis, but strong coarse patches of red and blue, and natural colour on the hair, &c. If the sculptures of the Parthenon frieze were painted in this kind of way, how is it that they present no similar appearance on any part of their surfaces? The inference to be drawn from such a comparison is surely too strong to be put aside, more especially when it points in the same direction as our æsthetic feeling on the subject would in itself lead us. Look, again, at the strong colour still left on some Egyptian coloured capitals and other details, centuries older than the Parthenon. If any part of the Parthenon was coloured as strongly as these examples, why are there no similar remains of it?

Our conclusion is, that the Parthenon frieze was relieved on a ground darker than the rest, with some addition of gilding, and with a low tinting rather than colouring of the figures and draperies. Leaving for the moment the question of sculpture in connexion with architecture, and considering the question of colour as applied to sculpture for its own sake, we may ask, in what way, if at all, should this be applied so as really to heighten the effect of sculpture without drawing it down too much from its abstract and ideal character as an art dealing in the main with pure form. As implied, we hold it to be still a question whether any colour at all is an advantage; whether anything is really more beautiful and more suitable for the calm severity which properly characterises this branch of art, than the white marble which has been so long the favourite material of sculptors. Gibson's experiments, of course, occur to every one when the subject is mentioned. In the "Hebe," the tinted hair and painted eyes give a doll-like look to the head, though the general appearance of the figure, with its warm tints and gilded ornaments, is harmonious and pleasing; the coloured edging to the dress, which is already fading off the ground, looks flimsy; and the tinting of the flesh surfaces has certainly spoiled the lustre of the marble, and given it a somewhat wax-like surface. The "Venus," in which the tinting is slighter and more delicate, is much more successful, nor can we say on the whole that the work, a very favourable specimen of Gibson's power, does not gain by this slight addition of colour. Whether on the basis of this example we would recommend that all statues be coloured, is another question. One thing, in the first place, must be laid down as a "rule absolute,"—that the method of colouring must never be such as to hide or dim the lustre and semi-transparency of the marble, which are among its most beautiful characteristics. It must be a stain, very thin in consistency, rather than a colour or pigment of any kind; nothing that will choke the surface of the marble can be tolerated. Then there is some difference in the case, accordingly as we have to consider an entirely nude statue or one partially draped. When a statue is to be considered *per se*, apart from architecture, it is obvious that the only colour which can suitably be placed on it is one which tends towards a representation of the natural colour of flesh; it may be very much less strong than that, still the tint added to the marble must be a very pale flesh tint, tending towards a suggestion of realism without approaching it very closely; that is the only kind of tint which can logically be added to a white marble nude statue, or to the nude portions of it. It may be doubted whether such a tint is in itself more pleasing or more suitable for high class statuary than untouched marble; it may be decidedly better when it becomes a question of connecting the statue with a scheme of decoration of which it is to form part, but that is a somewhat different case. In the case of a semi-draped statue the further difficulty arises as to the treatment of the drapery. A tint slightly approaching towards flesh colour is not suitable for drapery, and there then comes in the very important incident of making the drapery of a different tint from the figure, which is introducing quite a new element, giving a touch of pictorial effect to the work, breaking up the apparent unity of the material, and making it in some cases appear almost like the union of two materials cut from different blocks; an idea very detrimental to the appearance of durability of the whole, and at variance with the notion which properly belongs to sculpture, of being hewn out of a solid block of material. The effect is liable to degenerate into prettiness, and to be at variance with grandeur and dignity. There is a small statue of a bather, by Morton Edwards, in the corridor of the South Kensington Museum, in which the body has just a hint of flesh tint, the drapery is a very light warm pink, and the hair is coloured with a tone nearly that of nature, a light auburn; in this small work, a figure standing about 20 in. high, and rather sentimental in style, the effect is certainly pretty, but how would it be life-size? Or how would it be in the case of a statue of more serious and elevated style and intention? We cannot but think that in such a case the effect would seem rather an impertinence, and would interfere with the abstract and ideal character of the work. Take, as an instance, Mr. Simonds's well-remembered work, "Bacchus" on the tiger. Imagine the Bacchus with even a slight flesh tint; the tiger must then inevitably have had a slight but decisive representation of tiger-colour and stripes. Can any one say it would be possible to do that without materially injuring the abstract and poetic expression of the work, — vulgarising it, in fact? In proportion as we approach realism in such a work, we lose ideality and abstraction; the statue becomes, instead of the ideal Bacchus, only a man riding on a tiger.

The gilding of any object introduced as an accessory in a work of sculpture is often a very ligitimate and perfectly suitable means of giving some brightness of effect without interfering with the abstract expression of the work. We should see no objection, for instance, to a Pallas with a gilt spear and shield, a Cupid with a golden dart; and there are often other accessory ornaments which may be gilt with good effect (as in Gibson's "Hebe," before mentioned). Gilding, as before observed, stands on a different footing from colour; it is more abstract in effect, and it serves to give brightness while bringing out more forcibly by contrast the cold chaste white of the marble. Gilding applied all over a statue is quite another affair. In most cases this is undesirable, even vulgar; the cases in which it is defensible are only those in which sculpture is used as part of a decorative scheme; as in the House of Lords. In such a case, however, the sculpture proportionately loses its separate value and interest as sculpture; it becomes rather an *objet de luxe*, a kind of high light in the decoration. Where sculpture is to be considered separately and for its own sake, a nude figure entirely gilt would seem an incongruity, and the surface produced by the process certainly does not tend to bring out delicacies of modelling, but rather to confuse them under a general glitter of reflected lights. There may be a difference in the case of very highly draped statues elaborately costumed; where the surroundings will justify it, gilding may sometimes carry off the realisms of a costume statue better, at least, than marble would; but there must be sufficiently rich and sumptuous surroundings to keep it in its place and prevent it appearing gaudy; so that after all this comes back nearly to the question of sculpture in relation to architecture. There is no doubt, however, that the more costume in a statue is elaborated, the less is marble suitable for its execution. That material, with its pure tint, transparent lustre, and capability of delicate and sharp finish, is thrown away upon such work as the cutting of coats and trimmings, and button-holes and lace. Where the intention of a work is such that realistic costume must be adopted, this looks far more suitable in bronze, when the effect may become to some extent decorative in a way in which it could not in marble. Browning, who is always true in his insight on matters of art, glances at this in "Pippa Passes," where the sculptor is showing the works in the studio to his bride; his ideals, his Greek subjects, are in marble, but when she turns to the model for the statue of an emperor in a ceremonial costume, he says:—

> "Ah, do not mind that,—better that will look
> When cast in bronze,—an Almaign Kaiser, that,
> Swart-green and gold, with truncheon based on hip."

Common consent has tended towards the use of bronze for statues of this class; one of the most spirited of recent statues, Mr. Birch's, representing the gallant stand of Lieutenant Pollock against the mutineers at Cabul (at present in the Albert Hall Gallery), is an admirable example of a realistic work which tells with great force in bronze, but which would be quite out of place in marble. The misfortune is that in this climate, except under cover, the "swart-green and gold," so happily touched by Browning as the characteristic effect of bright bronze, soon loses its lustre. Partial gilding, we may suggest, might often be used on bronze statues with brilliant and not unsuitable effect.

The third method which we mentioned, of combining colour with sculpture, by giving the sculpture a coloured background, belongs almost necessarily to the connexion of sculpture with architecture. When sculpture is used in direct connexion with architecture it must be to a great extent rather decorative sculpture than work of the highest individual interest for its own sake. Sculpture of the highest class can hardly in general be introduced as a part of architectural design, on the mere ground of its costliness. Independently of that, the

introduction of statues in considerable numbers as a portion of the decorative design of a building is in itself at variance with the idea of making such statues of very marked separate interest. They must have a meaning, if possible an easily recognisable meaning, but they must also fall into their place as parts of a general architectural scheme, and not claim too much exclusive and individual attention. The place for a statue of the highest and most thoughtful class, in relation to architecture, is either in front of a building which forms an architectural background to it, or as the prominent and obviously central object in the design of a façade. A series of statues on an "attic" story, or statues on the pinnacles, like those of Milan, or covering a whole front, as at Wells, cannot pretend to the highest individual interest; at least, such work would be thrown away by being so placed, even if statues of the highest order could be procured and paid for *ad lib.* What are wanted in such a position are works which will add life and effect to the building when considered *en masse*, and possess sufficient individual interest to have something more to give to the spectator if he is minded to study them separately. With a good deal of our architectural sculpture, the interest of the work seems to vanish as soon as one comes to study it in detail. It is hardly high enough in style to be worth putting up at all, except where it is so far from the eye that its details are lost, and it appears merely as conveying the general idea of a figure. And for this object a somewhat rougher and bolder execution than that generally adopted would be better and more effective. A mistake is often made,—as, for instance, in the Foreign Office buildings,—in putting sculpture, on which a good deal of care and talent seems to have been bestowed, at the very top of a building, where whatever merit it has is nearly lost. Sculpture, executed with any delicacy or care in details of modelling and of drapery, should be placed lower down on a building, not hoisted up to the top; and sculpture which is intended to "crown the edifice" should be treated with appropriate breadth and largeness of style. In this matter we seem too often to fall between two stools, and our architectural sculpture is hardly of sufficient interest for separate study, and yet not effective enough in style for giving life to the architecture and asserting itself when placed in position at a distance from the eye, and regarded in relation to the general effect. If such sculpture, placed on buildings, is to have a definite meaning and expression in each figure, and to be worked out in detail to this end, then it should be placed on the lower part of the building and near the eye; if intended for the upper portion of the building, it should be very bold and broad in style and very simple and obvious in *motif*. To place statues on the attic or against the sky-line, which are obviously rather elaborately finished, and which have a definite expression and signification, if we could only get near enough to see it,—this is only to evoke the sculptor's talent in making a kind of puzzle for the spectator.

But in considering sculpture as a decorative addition to architecture, one cannot but think that just here the element of contrast or harmony of colour between the sculpture and its framework comes more naturally than in any other relation of sculpture, and seems to be most unaccountably neglected. The introduction of brown stone sculpture in the niches of a brown stone building has a very tame effect; and the sculpture itself, regarded from a decorative point of view, might be brought out so much better by either adopting a different coloured material from the architecture, or by giving a special colouring to the niche which sets off the figure. Without adopting colour at all in the statue itself, the introduction of gold mosaic, or of a coloured tile diaper, in the niche or panel against which the figure is placed and from which it is to be relieved, would be an obvious and very effective method of introducing brightness and variety of colour into a building in a perfectly suitable manner. Again, in architectural sculpture we might find admirable effects from the employment of self-coloured marble for the sculpture; a use of material which is not so good for sculpture when regarded separately and for its own sake only, but which would come in admirably in the case of the bolder and less minutely expressive style of work which is wanted when sculpture is to be used for decorative architectural effect. Bronze sculpture, again, has an admirable decorative effect in combination with marble, as Mr. Tadema has taught us over and over again in his paintings; and, though we cannot have buildings all of marble, the insertion of a marble niche or panel in combination with a bronze statue would be a very decisive addition to the effectiveness of a building in which the less salient portions of the work must be of stone. Browning, again, has hinted at this, in a passage very much recalling some of Mr. Tadema's combinations in painting:—

> "Did I say basalt for my slab, sons? Black,—
> 'Twas ever antique-black I meant! How else
> Should ye contrast my frieze to come beneath?"

The intended frieze being of bronze. For such "contrasts" of tone and surface, in the application of sculpture to architecture, there are almost endless materials available, and often at a cost very slight in comparison with the increased effect which would result from a judicious contrast of colours between the statue or frieze and its background. If we cannot decide exactly how the Greeks carried out this idea, we may at least set ourselves to consider how we can do it, with the money, means, and materials at our disposal under more or less favourable circumstances.

"THE HISTORY OF FREEMASONRY."*

SINCE the review in the number of the *Builder* for March 3 (vol. xliv., p. 266), the second volume of this carefully-compiled "History" has been published. The erudition and detailed study of the various subjects considered advisable to discuss is maintained. To the five chapters already published, Mr. Gould has added six others in this volume, comprising Mediæval Operative Masonry; the Statutes relating to the Freemasons, Early British Freemasonry (Scotland); Masons' Marks; the Quatuor Coronati (the four crowned or four holy martyrs); and Apocryphal Manuscripts. Seven portraits of Grand Masters, and one plate of "Masons' Marks," comprise the illustrations.

Under chapter VI., "Mediæval Operative Masonry," a very comprehensive description is given of the history of Mediæval architecture. It commences with the elucidation of the term "Gothic," formerly in such common use, and still frequently so, being taken in opposition to "Classic." The origin of the style is well considered, the opinions of such old writers as Walpole, Wren, Whitaker, Ledwich, Kerrich, Lascelles, Stukeley, and a host of others, being fully quoted; and Hope and Dallaway, with others of the moderns, ending with a quotation from Sir Gilbert Scott's "Lectures on Mediæval Architecture," affording the latest opinion on the subject. To the readers of the *Builder*, the details of this chapter will be familiar as one in a general history of architecture. It is also peculiarly interesting, as expressing the views of a learned barrister on the art. He is to be congratulated on the result, for an unusually readable and intelligent account of the works of the masons of the countries where Mediæval architecture flourished, has been produced, the facts and arguments being far above the usual level of such histories as written for Masonic publications, and rendering it a somewhat ungracious task to note any errors. However, there are two not to be passed over. He states in one place that Norman churches were not vaulted, the only instance given being the little chapel of St. John in the Tower of London; and in another place, that none of the Norman buildings were, or were intended to be so, and all vaulting on Norman piers and walls is subsequent. But he must have forgotten that the Norman crypts were all vaulted, as were also the aisles of Norman churches; probably he meant to write that the *naves* of Norman churches were not vaulted, and why they were not so finished has yet, perhaps, to be discovered, for shafts were in most cases carried up to receive vaulting. I do not agree that "it originated in the clumsiness of the Saxon workmen, they (the Normans) were forced to employ." "William of Sens, 1179, was the first to introduce stone vaulting in this country, at Canterbury," he states, which may, perhaps, be admitted if the vaulting of the crypts be excluded. The other correction is the doubt, expressed in two places, that the fine vaulting of the Gothic staircase at Oxford' erected as late as 1640 for Dr. Fell, is of stone. As access can be obtained above the vaulting, a friend, resident at Oxford, has lately assured me that it is of stone and not plaster, as asserted. The architect, or mason, whose name is attached to the work is "Smith," of whom, unfortunately, nothing more is known: he was evidently one of the last masons holding Mediæval traditions. Mr. Gould does not help us to account for the peculiar design shown at Roslin Chapel; he quotes the usual assertion that it is the work of a foreign architect, most probably a Spaniard; but as he has dethroned Sir William Sinclair from the post assigned to him of having been hereditary Grand Master of Freemasonry in Scotland, we had hoped that his researches into the Scottish records would have enabled him to afford true particulars of the design and erection of this eccentric work. Sufficient credit is not given to the "Five Sisters" in York Cathedral, which, instead of being 50 ft. in height, as stated, are really 60 ft., and each light is 5 ft. 7 in. wide. Having ourselves experienced the difficulty of ascertaining the exact dimensions of this most magnificent group of windows, we are glad of this opportunity of making the sizes better known.

Our author is rather inclined to think little of the occupation of this island by the Romans. "I must be allowed to state my belief that the architectural efforts of Rome were, in Britain, comparatively inferior," and while citing the camps and remains of walled cities and military roads, adds, "the efforts of luxury and refinement are few and far between, although, in the solitary instance of Woodchester, a villa has been found whose dimensions almost equalled the Laurentine one described by Pliny." I think a reference to Mr. Henry Godwin's "English Archæologist's Handbook," 1867, pp. 18–70, would have assisted him towards a better appreciation of the numerous edifices erected by the Romans amongst us.

In the pages following Mr. Gould writes,—"It may be as well to dispel, as far as possible, the exaggerated notions current concerning the piety and devotion, or, as some would prefer to call it, the extravagance and superstition of the Middle Ages, and the enormous cost and sacrifices required for the erection of Mediæval ecclesiastical structures." He describes several of the then ecclesiastical ways of "raising the wind"; and remarks, "Nor was the expense of these buildings as great as would at first sight appear. One of the most eminent of our engineers once amused himself towards the commencement of the present century by making an estimate for Lincoln; the result was that he would take the contract for about 1,000,000*l.* present money, presuming that he had only the same means of transport and the same mechanical appliances that were available in the Middle Ages. At this rate it could have been built for 7,000*l.* a year present money. York, presumably rather more costly, but which lasted (was in erection) much longer, would have cost less." "On the whole, we may compute the expenditure of the 9,000 parish churches or thereabouts, existing at the Reformation, at between fifty millions and sixty millions pounds present value, taking the modern average cost of a church, and that of the cathedrals, twenty in number, at from six millions to seven million pounds, a total of about sixty-five million pounds spread over a period of more than 400 years. The amount (approximate, but pretty closely calculated) spent on church—not chapel—building, restoration, and enlargement has, since 1818, when people first began to move in these things, amounted to fifty million pounds, of which one million has gone to cathedrals. Putting schools in the place of abbeys will allow of a still further comparison. The amount spent upon church school buildings has been eight millions. At the Reformation there were 645 monasteries, 90 colleges, 2,374 chantries, and 110 hospitals, or, without the chantries, 845. Could they have been built, on an average, for 10,000*l.* a-piece? I think not, although the really costly and magnificent buildings were much fewer in number than are usually supposed. Their aggregate *revenue*, though very different estimates have been made, amounted at that time to about 150,000*l.* a-year, which, from various calculations, has been proved equal to five millions at the present day, or, at least, the rent-roll of the estates would now amount to that sum. The income of the clergy during the past fifty years has increased by about one million per annum from

* The History of Freemasonry: its Antiquities, Symbols, Constitutions, Customs, &c. Derived from Official Sources. By Robert Freke Gould, Barrister-at-law, Past Senior Grand Deacon of England. Vol. ii., 4to., pp. 253 to 504. London: Thos. C. Jack, 45, Ludgate-hill.

various sources, and the endowed charities (including schools), almost all of which owe their origin to within the last 300 years, to about as much more." These calculations are interesting, but may be open to much criticism, as, for instance, Kirkwall Cathedral is put down "to cost 20,000*l*. At the present day this would give a regular annual expenditure of 50*l*.; it was founded 1138 and not finished until 1540." But if the history of this building is looked into somewhat more closely it will be found that in 1511 three pillars and a new east end were added, and in 1540 three pillars and a new west end, which were never completed, were added. "The original design has been carried out with tolerable consistency," writes Mr. Gould; but if the above dates be correct it would seem that almost the whole of the church was *rebuilt*, in about thirty years, and therefore at a cost of about 700*l*. per annum. The numerous rebuildings and repairs to the cathedrals and to the other buildings above named, must also be taken into account as part of the large sums spent on them. This has been a long extract, but not an unnecessary one.

"I must now proceed," writes Mr. Gould, "to show who were the men who erected the great buildings just described"; and again, "Who were the actual architects and designers of the Mediæval edifices? and were they operative masons, or at least men belonging to that body?" "We somehow know the names of all the architects in Italy," he very justly observes. Vasari and others, including Gaye, as well as the compilers of biographies of artists, in almost every town of importance, have done this for Italy; for Spain, Caen Bermudez and Llaguno are the authorities; Raczynski for Portugal; Felibien, and several modern writers, as Lance, for France, and Otte for Germany; while Belgium and Holland have not been neglected. But if we except Britton's "Glossary of Architecture," there is no exclusive work proclaiming the designers of the Mediæval buildings in the British Empire. Such a work has been in preparation for many years, in extension of the two papers before referred to, as read by myself at the Royal Institute of British Architects, and may yet be published if time permits. "Of the names of the masons that have come down to us, but few betray a foreign origin, the great majority being those of persons who, apparently, were natives of the districts in which the edifices were reared, with which their names are connected. This will account, in a great measure, for the local peculiarities, such as are constantly met with, and which seem to indicate the existence of local schools." He quotes the following words of the late Mr. Street:—"Of the churches of the early Middle Ages, I could have told you how they may be classified into groups, speaking to us of the skill and genius of individual architects, each in his own district or diocese." It is a pity he had not been able to do so. Mr. Gould writes:—"The first theory, that of *a universal brotherhood*, is contradicted by the absolute silence of all history, no less than by the very strong negative evidence on the other side, and that on evidence afforded not merely by history, but by the appearance of the actual edifices. Wren, if we accord him the credit of the outline of Masonic history given in the 'Parentalia,' blended conjecture with tradition." This included the travelling bodies of Freemasons headed by a chief. "No great art was ever practised by roving bodies moving from country to country; still less could it have been so, when, in the Middle Ages, the means of *locomotion* were so few, and especially was it impossible to transfer large bodies of skilled labourers from one country to another." On this word "locomotion," much might be written to prove the immense amount of it that took place during the periods under consideration. The monarch and his court, the abbot who had to attend the annual consensus of his Order; and the great number of pilgrimages, all tend to prove that "locomotion" was general, if not easy; why then should not the Master Masons have journeyed? Mr. Gould refers to a few examples in his work,—as, the Englishman Brigínthe * employed at Vercelli in 1219; Constantius, the father of Constantine the Great, who is said to have rebuilt Autun in 276, by the aid of artificers from Britain, which was then renowned for its skilful workmen. This very early statement would refute the assertions of "difficulty of locomotion" and "impossibility of transferring large bodies of skilled labourers." Again, William of Sens was selected from other skilled artificers, 1179, to design the work at Canterbury. Etienne de Bonneuil, of Paris, travelled, 1287, to Upsala, in Sweden, to erect the cathedral, being accompanied by ten *compagnons* and ten *bachelers*. Mr. Gould cruelly adds, "Was he a designer, or, rather, a mere contractor, with the power of drawing, or, at least, of paying some one who could?" As if such things were done in those days.

In the foregoing and following remarks, taken from Mr. Gould's carefully-considered pages, it will be observed that he much insists upon local peculiarities produced by local schools; but possibly, from not having studied in this art, he has not perceived the difference between the *styles* or periods of architecture and the mere differences *in the style* caused by local influences and materials. This is a vexed question, and he has not solved it. We see the reason for the Norman style, on being introduced into England, being continued alike all over the country, with more or less modification. But, how came the transition to Early English, as we call it, and then that style or period worked throughout the country, and so on so uniformly, unless there was a leading institution, guild, or lodge, from which the change emanated, and spread by its professors having received their lessons in the new system of "proportion" with outlines of moulds and details. "I may remark here," writes Mr. Gould, "as showing how much local peculiarities have to do with our Mediæval churches, and how little ground there is for supposing one universal consensus, that almost every district in England has its distinct architectural features. The northern counties are a class apart; so are the eastern counties. Northamptonshire, which boasts a very fine and complete series,—showing a distinct school. A no less distinct school in Somerset, independent, apparently, of Wells, and St. Mary Redcliff." "The sculptures of the façade of Wells are a truly national monument,—they were finished 1242. They are English in design, and wholly different from the contemporary works executed in Edward the Confessor's Chapel, Westminster, by Benvenuto and Torell: these are the words of Professor Cockerell." The author adds,—"There is every evidence that the building of the nave is of the same date, and is like the front, the work of a local school of masons whose influence can be traced to a very considerable extent in the neighbouring district." "Devonshire, again, and Cornwall have their own peculiarities, not to mention numerous other districts, but taking only the most striking. Gloucestershire, also, had very decidedly a school of its own." Again, he continues, "Gloucester seems to have been a regular school of masons,—a kind of architectural college, in which theory was very properly mingled with practice, and from which, according to the best authorities, fan-vaulting took its rise. There was also, probably, another but earlier school at Wells." Yes; but was it not the case at each cathedral? As stated by me before, each cathedral had its own lodge of Masons attached to it; from whence came the lovely early work at Lincoln Cathedral, the grand, masterly-proportioned work at York, and so on, but from the local workshop, each endeavouring to outstrip and outshine the other, only limited by experience and funds at their command? "The fan-vaulting at Gloucester, is confined to the cloisters, where it appeared on a comparatively small scale, as far as mere width is concerned, as was natural in a preliminary essay. It extended to Bath Abbey church, to the small square chapel round the apse of Peterborough, the Beauchamp Chapel, the Divinity Schools and the cathedral at Oxford, until it culminated with the three famous chapels of King's College, Cambridge; St. George's, Windsor; and Henry VII.'s at Westminster." Quite so; but how was it done? Did Gloucester supply a master mason to each locality, or did the chapter or other authority intending to build send to Gloucester their own master mason to learn the secret of their new method? "The architecture of Scotland," he adds, "has a style peculiarly its own. Severely archaic in its forms, and small in size as are the buildings, the openings and mouldings yet display a degree of richness we should look for in vain either in England or elsewhere. The vaults, especially in the earlier examples, are singularly bold, but heavy, and their whole architecture is characterised by ponderous richness." "I have now shown," writes Mr. Gould, "as clearly and as concisely as I can, that the idea of a universal body of men working with one impulse, and after one set fashion, at the instigation of a cosmopolitan body acting under a central direction which has been very generally believed in, is a myth." We have, however, no proof of anything of the sort in England, for we do not yet know sufficiently how the guilds or lodges worked, if for instructing their members. But the chapter in this volume headed "Early British Freemasonry (Scotland)" has, according to my views, let us know something of the authority certain lodges exercised over others. Mr. Gould informs us that "the statutes promulgated by William Schaw, master of work to King James VI. of Scotland, and dated the 28th of December, 1598, were compiled in order that they might be sent to all the lodges in Scotland, having received the unanimous sanction of the masters convened at Edinburgh." "They were in force in Aberdeen, Banff, and Kincardine, just as in all other parts of Scotland." Is not this a sufficient evidence of a head lodge or school, helping to prove where a consensus could be held when necessary? Now, where was the similar place or places in England? We must refer our readers who may be following this subject, to our comments on the next chapter.

Viollet-le-Duc says that no certain amount of the personality of architects exists before the thirteenth century, and thinks that there must have been schools, and pupils taught by apprenticeship ("Dict. Rais.," *s. v.* "Architecte").

Mr. Gould has compiled as many instances of workers on edifices in Great Britain as could be recovered from the restricted sources previously pointed out. He quotes several clerics recorded as skilful architects or skilled in building, and is assisted in his views by Lingard, who, in his "History of England," i. 266, writes:—"In the monasteries the monks practised the different mechanical arts. By a law published in the reign of Edgar, but probably transcribed from a more ancient regulation, every priest was commanded to learn some handicraft in order to increase knowledge." "We gather the names of *seven cementarii*, who evidently were more than mere workmen, or even master masons, in our sense of that term; and we have also the names of *thirteen* clerics, who are supposed, with more or less appearance of truth, to have been,—and some, at least, who certainly were,—architects." But who designed the mouldings and ornament? even giving the clerics the credit of the arrangements of plan and so on, as each monastic Order had its own. "The *cementarii* were of all ranks and classes."

Mr. Gould reserves to the last "the consideration of the list of ecclesiastical architects, real or supposed,"—such as Gundulf, Flambard, Paulinus, Arnold, a lay brother of Croyland; Stowe and Henry at Evesham, Elias de Derham, Nicholas Cloos, Alan de Walsingham, William Bolton, and William of Wykeham, of whom he judges "that the balance of probability is a good deal in favour of Wykeham," but if so, what becomes of the arcanum of the masons, as there is no assertion he was a mason; but, adds Mr. Gould, "at any rate, which is a point of importance, he had under him three eminent artificers"; and so very probably has Sir Edmund Beckett at St. Alban's Abbey. "We obtain seven *cementarii*, and thirteen clerics; the former were of all ranks and classes,—and were not, by any means, all the mere workers raised but little above the class of journeymen, that professional jealousy would sometimes have us believe"; but "Mr. Papworth records (in 1861-62) an opinion that it is to the master mason, as a general rule, that we may turn for the actual designs of all the well-known erections of the Middle Ages." This is still my opinion, but Mr. Gould appears unable to go so far. With mingled feelings of amusement and gratification I perceive that the two latest historians of Freemasonry, Findel and Gould, have quoted frequently from these two papers.

"I have sought to prove that the operative masons had a much larger share in the construction of these buildings than is usually supposed, inasmuch as they were, to a very large extent, the actual designers of the edifices on which they worked, and not the mere servants of the ecclesiastics." And "I have sought to trace the actual designers of these

* This name is printed "Brigwithe" by Mr. Gould and his authority; the plan with the English square east end is erected; the round arch of Italy is used externally, at the time that the pointed arch, as at Salisbury Cathedral and other buildings in England, was being introduced.

marvels of operative masonry, by means of the structures themselves, which amply attest the ingenuity, if not in all cases the individuality, of the skilled workman by whom they were designed." "On the whole, I should be inclined to conclude, generally, that out of Italy and during the Middle Ages the class whom we call architects did not,—save, perhaps, with very rare exceptions,—exist; and that all the buildings we so much admire were the combined work of certain priests and monks educated specially for the work, in conjunction with their master mason, usually attached to the building, as at York, and more often by the master mason alone; but that, when the latter was the case, the master mason was an independent individual; the arrangement last mentioned being more common abroad than in the British Islands." "My impression is," writes Mr. Gould, "that, speaking generally, the Masonic body had little or nothing to do with military works, save in a very humble capacity; and that while they doubtless built the town-halls,—for we cannot conceive two distinct bodies of the same trade working systematically apart,—yet that some, doubtless, adhered much more to one class of work than the other." There is also another class of workmen inquired into, namely, the "bridge builders," but having disposed of them in my paper read in December, 1861, it will not be necessary to revive my observations, Mr. Gould having quoted them sufficiently, and not having to add anything of importance, except a chronological account of those down to old Blackfriars Bridge, designed 1760, by the descendant of the mason Mylne, who "came out of the north countrie to Dundee and Perth."

Throughout this volume, comprising the mason's trade, as was naturally to be expected, that of the carpenters is ignored. There were, undoubtedly, "Free Carpenters" as well as "Free Masons," and the carpenters were imbued with the same principles of design as were the masons. How came the carpenters to change their art as the several periods of Mediæval architecture were changed, at the same time as with the masons? Had the carpenters similar local schools and peculiarities as already discussed in respect of the masons? We have no proof of this: hence it leads more and more to a consensus of trades. But a curious coincidence is narrated in the following chapter given in the volume, and the connexion is somewhat elucidated by the action taken by the Scottish corporations. The "Incorporation of Wrights and Masons" was constituted by an Act of the Magistrates and other authorities of Edinburgh in 1475 (ratified by the Archbishop of St. Andrew's in 1517, by Royal Charter in 1527 and 1635, and by the Common Council in 1633), and though originally confined to the members of those two trades,—who have for many centuries generally worked harmoniously together,—in time received into their number the glaziers, plumbers, and others, by decision of the Court of Session, 1703; it was known usually as the "United Incorporation of Mary's Chapel." And the "Seal of Cause" of 1600, at Glasgow, "was required to separate the *wrights* (carpenters) from the *masons* as an Incorporation, the coopers having been disjoined in 1659. The reasons offered by the wrights for such division are carefully recited, and were granted by the magistrates and town council on May 3, 1600. The wrights had a deacon and elder and are called *freemen*; they pointed out that the masons could not judge of *their* work, and *vice versâ*," and they were separated. The first notice of the minutes of the "Glasgow Incorporation of Masons" is dated September 22, 1620.

Mr. Gould then proceeds to record some details connected with the English Lodges:—"But at whatever period the masonic bodies first took form, the ceremonies and customs by which they were distinguished are at least of much earlier origin than our oldest constitutions." He then recites the various references to the customs of the workshop or "lodge," the establishment or the master providing tunics (gowns or liveries), skins for (white) aprons, (white) gloves, and clogs; "strikes, boycotting, and rattening were, even in those remote times, not wholly unknown"; taking of apprentices, and so on, extracting largely from the two papers before mentioned, read by me in 1860 and 1861. "As regards the grips and signs *attributed* to the early builders,—that artisans of an especial trade should have peculiar modes of recognising each other when travelling in search of work, is nothing but what might have been expected,—although, I believe, they did not arise, or at least traces of them have not been found, until comparatively recent times. On masons' marks, he devotes a separate chapter towards the end of the volume.

"The *building fraternities* or trades of the Middle Ages must have been in many respects like those of the present day, or rather like those of the 'Companionage,' which seem to be their legitimate descendants, *i.e.*, as a trade society or union, and must have been essentially different from the *guilds*, although a masons' guild certainly existed, and still exists in London." From this clause, we gather, he considers the two co-existed.

"We must remember that *books*, in our sense of the word, scarcely existed, and that the great bulk of the teaching was *oral*, whilst books of practical geometry did not exist at all." A statement is often seen that William Rede, Bishop of Chichester (1369-1385), who is said to have been the first mathematician of his age, displayed his art in the building of his Castle at Amberley (in Sussex). "I shall not dispute the worthy bishop's mathematical skill, nor, after the display of his military proficiency, that he was the architect and engineer of his own castle." We may remind Mr. Gould that Adhelard, of Bath, is stated to have brought the first Arab book on geometry into England, in the reign of Henry I. (1100-1135); also of the letter from Theodoric, given in Cassiodorus about Euclid and geometry. The knowledge of geometry was probably well retained. Albert Dürer, in 1525, published his "Institutionum Geometricarum," and we have that curious work by Roriczer of Regensburg, on the "Ordination of Pinnacles." Halliwell, "Rara Mathematice," pp. 27, 57, would be well worth referring to on the subject. Was the science so well understood, even orally, in the middle of the thirteenth century that it led to the change of art in architecture taken by the "Geometrical Pointed Architecture," the term now given to that period of art between the Early English and the Decorated of Rickman, to which the dates 1270-1330 are given by Freeman; about 1250-1300 by Poole; while Sharpe assigned the years 1245-1315 for its range? "The great cathedrals abroad, with their far loftier elevation, the width and boldness of their vaulting, the vast and scientific series of flying buttresses and counterpoises, which are so highly artificial, required, in all probability, more scientific skill than could well be expected from any class of men not absolutely in the profession. Indeed, this may well have been the Masonic secret, if secret there were, of the Mediæval masons,—the masons who acquired great scientific skill,—and that skill could then only be obtained by oral teaching, actual practice, and rule-of-thumb."

Mr. Gould then presents some facts, interestingly put, connected with *foreign builders* and workmen, into which it is unnecessary here to enter, save to state that I do not perceive the connexion between the terms "Lambordos" and "Lombards"; but I agree with him that it would be an immense gratification to find in England a Mediæval sketch-book similar to that of Wilars de Honecort, discovered in the library at Paris, especially as so few drawings are to be found of English work; and that Meister Johann, who worked 1301-30, was not the first mason employed at Cologne Cathedral, that structure having been commenced fifty years earlier. Very little information, comparatively, is given about the German masons.

The criticisms on some modern architects, as those of an amateur, are amusing, and required a further acquaintance with the lives of those mentioned. Thus, Inigo Jones is represented as an artist and a designer of masques! Wren may be best qualified as an F.R.S., though he had certainly travelled and studied in France! Perrault was a physician; Vanbrugh was, at least, as much a play-writer as an architect! Lord Burlington and Dean Aldrich were competent to erect beautiful buildings by their own unaided talents! But Jones, the father of English revived architecture, though an "artist,"—as it is hoped all architects are,—gave up masques for architecture, and travelled for study twice to Italy. Wren, a great geometrician, only went once to the Continent, and then only as far as Paris. Vanbrugh gave up play-writing for architecture; and Lord Burlington had generally an architect or two living in his house.

In Italy, writes Mr. Gould, Palladio is the only pure Italian architect whose "name is in everybody's mouth"! What, then, becomes of Vignola, Serlio, and Scamozzi, those other revered masters of modern art? "So it is with France and Germany," and,—think of this ye English architects, and ask, What is fame?—"In England, beyond Inigo Jones and Wren, Chambers and Barry are the sole popular names. Vanbrugh is remembered more for his comedies than for the magnificent palaces of Blenheim and Castle Howard; while if a man can enumerate any of the works of Hawksmoor and Gibbs, of Soane, of Smirke, and of Wyatt, he passes for more than ordinarily instructed in the history of English art." Chambers I should have doubted as being a popular name. His only great work is Somerset House, and if the majority of the Londoners were asked who built that edifice, they would be more likely to reply, "The Duke of Somerset, in the reign of Edward VI.," than Sir William Chambers.

I must break off, however, for a time.

WYATT PAPWORTH.

SOMETHING ABOUT SANDGATE AND ITS CONVALESCENT HOME.

ALTHOUGH a comparatively small town, consisting of one main street and a number of short offsets running beachward and inland, yet Sandgate and its immediate vicinity offer many attractions to visitors and health-seekers. As a place of business and trade the town is handicapped by the near proximity of Folkestone, which is less than half an hour's walk from the former. Sandgate, though quiet, is nowise a dull place, particularly in the summer season, and Shorncliffe Camp, which is situated on the hills a short distance inland and above the town, adds, by its wants, to the business of a number of the shopkeepers, and, by the field-days and sports of the military, to the attraction of both residents and visitors. If the lords of the soil, who are lords *de facto*, the Pelhams and the Radnors, were a little more disposed to open a portion, at least, of their lands to building speculation, Sandgate would soon expand in size and also in prosperity. The town could scarcely be more favourably situated, lying, as it does, at the foot of high cliffs or hills, crested by the large plateau of the Shorncliffe Camp. On its westerly end the roadway skirts the sea, and between the railway-station and the entrance to the town a very fair esplanade, or broad pathway about a mile in length, runs along the shore, on which seats are placed at suitable distances. Indeed, it may be said that the Sandgate and the Hythe Esplanade join, and thus as it were form a promenade of two miles in extent. For the information of invalids or health-seekers, we may add that Sandgate is well sheltered, situated as it is on the easterly curve of a fine bay formed by the land ending in Dungeness, in the westerly direction, and on the east by the Folkestone Cliffs. On the brow or incline of the hills running along the inland side of the town proper, and along the approaches thereto, facing the esplanade, at intervals, there are short terraces of houses and detached houses here and there at different heights. As the hills or heights are wooded in places the inland side of Sandgate presents a most pleasing sight in the summer time, and from the elevated position of most of these houses the visitors who may frequent them have a fine view over the town and on to the sea. Steam and sailing vessels are constantly passing in the distance, and on a fine day the cliffs of Boulogne are visible.

The Sandgate beach is wholly a shingle or pebbly one, and during strong seas and winds, and particularly in winter time, the beach-shifts or the ridges of pebbles are being continually carried out and in by the action of the tide. The shingle beach is considered more healthy than a sandy one, though at times it is rather rough to walk upon, save along the margin of the tide, where the beach is more even, if more damp for the feet. There is almost an entire absence of shells along Sandgate beach, so in this respect the children of visitors will be disappointed in their hope and quest.

The town possesses a Local Board, which appears in the past, at least, to have performed some good work in respect to water supply and the outfall drainage. In regard to the former, we found the supply of water pure and drinkable, the source being springs, which we understand are not sunk in a chalky soil. The water

supply of the Shorncliffe camp comes from Folkestone, and has to be pumped up to the needed level. This supply, however, is derived from a chalky soil, and, of course, it is not so palatable as the pure spring water of Sandgate. In case the present springs at Sandgate should in time prove insufficient, the Local Board has in reserve some others to fall back upon. As the Local Board at present does not seem to have too much to do, its attention might be directed to the paving, surface draining, and sanitary state of the short streets or passages that run off the main thoroughfare beachward, and also of some of the small houses in these passages.

We visited a block of brick buildings intended for the housing of the working-classes erected a few years since by a gentleman lately deceased, and whose loss is deeply lamented; these proved a real benefaction to Sandgate. These dwellings are arranged in one, two, three and four rooms, to suit the different wants of the occupants. The rooms are rather small and the drainage is open to considerable improvement. It is reported that the benefactor who built them was very dissatisfied on their completion, and expressed a wish that he would like to pull them down and have them re-built. We assume that it was with the internal arrangements and provisions that he was dissatisfied, but the benefactor is now in his grave, and the building remains. The rooms appear to let well, and the present Committee of Management are said to look sharply after the rents. The external brick-work of this model block of industrial dwellings is disintegrating fastly, and a useless amount of ornamentation in coloured brick panels, and of work by sticking on towers or pinnacles at the angles, appears to have been gone to, which has little or no effect at the present time. Industrial dwellings, without being altogether bare and barrack like, should be built economically, and the chief attention should be devoted to the arrangement of space and sanitary provision internally.

The old houses of Sandgate,—and, indeed, some of more modern date,—have characteristic weather-boarding front and back, and on the sides that are not joined to other houses. Some of the older class of these weather-boarded houses are, in fact, half-timbered dwellings. At present, as well as in past times, the denizens of Sandgate are fond of bay or oriel windows. Shopkeepers at the present time are putting in rotund or bay shop-windows, in some cases corresponding in taste with the drawing-room windows above them. In a few of the very old weather-boarded inns and private houses, a quantity of ship timber appears to have been used in the joisting, roofing, and other work which alterations and repairs are revealing from time to time.

The fishing interests of Sandgate are very small; indeed, the few boatmen there hiring their boats out for visitors or pleasure parties in the summer, and doing a little fishing out a short distance from shore, in winter or otherwise at night time, if there be a necessity for their exertions. Folkestone, however, sends its fleet of fishing-boats out daily, and they can be witnessed at work often in Sandgate waters. The boatmen in Sandgate badly need some better place of safety for their boats than that of lying upon high ridges of shingle, over which they have to be dragged in and out of the water.

Sandgate at present can boast of an excellent Convalescent Home, which we carefully went over during our visit. The house is an unpretentious-looking one in its frontage facing the main street, but its sea front with its verandah and terrace, and the addition made some few years since to the building in its westerly end and facing the sea, give it a very good appearance from that aspect. The house, before it was purchased for a home, went through many hands, and was subject to sundry alterations and additions. Some alterations were rendered necessary to fit it for its present uses. Looking at it and through it as a whole, it might be safely said that no architect would, in his wildest fancy, have planned it as it stands, yet, notwithstanding, the building is commodious within and well ventilated, a desirable matter in a Convalescent Home. The Institution at Sandgate, which is the outcome of the London Samaritan Society and Homerton Mission, was first established at Dover between three and four years since, but the building there proving too small for the growing calls of the institution, and no other suitable building presenting itself, the house at Sandgate was taken as a freehold at the low price of 2,600*l.*, the owners accepting 500*l.* less afterwards in consideration of the purpose for which the building was intended.

The Convalescent Home at Sandgate could not be better located for the health of the patients, their sitting and reading room looking out to sea and the tide daily coming up within a few feet of the sea-front of the Home. It may be worth mention that the last resident or occupier of the house before it was converted to its present uses some months since, was the well-known Mr. Sampson, the writer of the Money article in the *Times*, and in this building also Mrs. Sampson died, not long after her husband.

The Sandgate Convalescent Home presents one of the nearest approaches to a suitable home to meet the wants of the respectable members of the working-classes, or of clerks and other persons whose incomes or wages may be limited, or suspended for the time being through a long spell of illness. Three weeks' or a month's rest, if required, is afforded in the Home to all patients, men and women, and no distinction is made as to religion or country, patients from all parts of the three kingdoms being eligible. Certian large manufacturing firms in London contribute a lump sum in the year to this Home, and have the privilege of sending a number of their *employés* to the Home at a very small charge. Subscribers of a guinea annually have the privilege of recommending one patient yearly, and every donor of ten guineas, paid in one sum, has the privilege of recommending a yearly patient. An ordinary applicant or patient will be accommodated with three weeks' residence in the Sandgate Home at the small cost of 2*l.* 1s.,—this sum also including the railway fare to and fro. From repeated visits and inquiry we found that the Home is well conducted, and the food and fare are very good. We found no disatisfaction expressed on the part of any of the patients, the majority of them going home after their sea-side rest thoroughly convalescent.

As Convalescent Homes are most useful institutions when well conducted, and as fresh ones are being started yearly, we thought a few brief words about one we personally visited would not be amiss.

On the question of the proper planning and arrangement of Convalescent Homes a good deal might be usefully written, as well as that upon hospitals and hospital administration. Sanitary, warming, ventilation, and other problems are involved, to which due attention must be paid, so that the Convalescent Home may be truly what it purports to be,—a home of health as well as rest.

STRENGTH OF MATERIALS.*

THERE are few branches of human knowledge in which a more rapid and steady advance has been made during the present century than in the scientific appreciation of the strength of materials. To the architect, to the engineer, to all engaged in the industrial arts, a competent knowledge of this strength forms the very basis of successful design. One of the earliest papers in the first volume of the Transactions of the Institution of Civil Engineers is "An Elementary Illustration of the Principles of Tension, and of the Resistance of Bodies to being torn asunder in the direction of their Length, by Thomas Tredgold, M.Inst.C.E." A little later we find "Experiments on the Force required to Fracture and Crush Stones, made under the direction of Messrs. Bramah & Son, for B. Wyatt, Esq., Architect." From that time to the present the subject has attracted the attention of able and industrious men; the chief stimulus to research having probably been given, as we have elsewhere mentioned, by the need for experiments, of a character at that time unprecedented, as preliminary to the construction of the Menai Bridge by Mr. Robert Stephenson.

In the "Life of Sir W. Fairbairn," which we reviewed on its appearance in 1877, will be found indications of our comparative ignorance of the strength of materials, as applied to the construction of bridges of large span, so recently as 1845. Mr. Stephenson's idea for the Menai tube was, that it should assume either a circular or an egg-shaped form; and it was as the outcome of a long series of experiments that the design of which a sketch will be found on p. 201 of the "Life of Sir W. Fairbairn" was arrived at. The mathematical investigations made in order to draw up formulæ as the result of experiment were conducted by Mr. Eaton Hodgkinson. From this beginning, down to 1870, Fairbairn built and designed nearly 1,000 bridges, some of them of large spans varying from 40 ft. to 300 ft.

The fourth edition of Sir W. Fairbairn's "Application of Cast and Wrought Iron to Building Purposes" was printed in 1870. Another contribution of great value to this investigation is found in the "Experimental Inquiry into the Tensile Strength of, and other Properties of, Wrought-Iron and Steel," by David Kirkaldy (the inventor of a special apparatus for testing strength), of which a second edition was published in Glasgow in 1864.

The question of the strength of materials has a two-fold nature. On the one hand is the inquiry into the definite resistance which iron, steel, wood, stone, or any other substance opposes to tension, to compression, to torsion, to impact, or to any other form of disturbing force; and, on the other hand, there is the investigation of the structural forms into which such material should be converted, for the purpose of obtaining the exact strength for any defined purpose, including that margin over the net strength, which is known as the factor of safety. The solution of these structural problems by graphical construction is one of the most elegant, as it is one of the latest, outcomes of scientific study. Among books of this nature we reviewed, some two years ago, the detailed and elaborate work "On the Graphical Determination of Forces on Engineering Structure," by James B. Chalmers, C.E.

We might cite other works on the subject, of more or less value, but such a bibliographical chapter would, perhaps, be more suitable as an addition to the second edition of Mr. Box's valuable work than as a contribution to our own pages. Notwithstanding all that has been written, there is room for this treatise, and room that has been excellently filled up by the writer. The names which a glance at the history of construction for the last forty or fifty years naturally calls to mind will be found in their due order (with the exception, we think, of Tredgold) in the pages of "The Strength of Materials."

Mr. Box tells us that his objects have been (1) that the rules and data which he gives shall be correct, and therefore trustworthy; and (2) that their application to practice shall be clearly understood; for which purpose every rule has been illustrated by examples worked out in detail. In respect to a work written on this plan, and comprising 520 closely-printed pages, it is beyond the scope of the reviewer to attempt to stand godfather for every statement. But we can say without hesitation that the arrangement is clear, the plan good, and the execution, so far as we have been able to test it, in no way inferior to what the subject demands.

Mr. Box first speaks of tensile strain, referring to the effect of melting cast-iron; to welded and to screwed joints, and to the effect of annealing. He then passes on to the subject of riveted joints; and reviewing boiler work and girder work of this mode of attachment, passes on to the strength of tubes and pipes, and then to that of chains and wire ropes. He then discusses the shearing strain and the crushing strain.

The appreciation of the values of these different resistances leads to the enunciation of the theory of pillars, and their relation to transverse strains. Chapter IX. treats of the wrinkling strain, and of the "laws of wrinkling"; and Chapter X. gives general rules as to the transverse strains. There is then a chapter on "Similar Beams," followed by one on the connexion of transverse and other strains.

The reader is then led to inquire into the load on roofs, the proper strength for rafters, tie-rods, struts, and other roofing details, and the construction of curved roofs. We then have chapters on the torsional strain; on extension and compression; on the deflection of beams; on torsional elasticity; and on the modulus of elasticity. Four chapters, on impact, on the collapse of tubes, on "the factor of safety," and on "fatigue of materials"; and an appendix full of valuable information, complete the volume. It is a book of the utility and the

* A Practical Treatise on the Strength of Materials, including their Elasticity and Resistance to Impact. By Thomas Box. London: Spon. 1883.

careful accuracy of which we can speak in high terms. At the same time, rather as a mark of the rapid march of science than as throwing any slur on the research of Mr. Box, we are struck with the fact that the elaborate and excellent chapter on the collapse of tubes, founded mainly on the experiments of Mr. Fairbairn, and leading up to the "factor of safety," is already almost relegated to ancient history by the successful application of corrugation to the strengthening of tubes. We are not at this moment aware of the date of the patent under which the best known form of the application of this method has been carried out, viz., in the Fox and Hopkinson steam-boiler, as made by the Leeds Forge Company, at Leeds. But we can state from personal experience that a brass tube which it is perfectly easy to bend out of form between the finger and thumb, becomes, by the introduction of corrugation, able to resist a very considerable compressing force. We are not concerned, at the moment, to discuss the advantages of this particular form of boiler. But the invention is one of those things which are so simple,—when once found out,—as to lead to the question, "Why was this not done before?" That while the strengthening of iron plates by corrugation is so old that corrugated and galvanised iron plates were employed by the Admiralty in Pembroke Dockyard in 1847, the application of the same admirable expedient to the strengthening of tubes, and especially of boilers, should not even be mentioned in a work so late, and so excellent, as that of Mr. Box, is a fact that shows that the activity of the engineer still keeps, as has so long been the case, in advance of his information, as to what has been actually effected over the whole field of practical science.

BRAMSHILL.*

BRAMSHILL PARK is pleasantly situated in the north-east corner of Hampshire, and is reached in half an hour's walk from the Winchfield Station on the London and South-Western Railway. The surrounding scenery is such that its exact counterpart is not to be met with in any other district in the kingdom, and it is proverbial for its wide stretches of heather and gorse-covered common land, and its noble growth of Scotch fir, self-sown, and luxuriant beyond belief. Kingsley,—no mean authority where the charms of natural scenery are concerned,—alleged that Bramshill Park is the "*only* place in England where a painter can see what Scotch firs are." But the chief attraction of the place is the house. It occupies the site of an earlier structure built before 1306, in which year the Bishop of Winchester granted its owner and his wife permission to have the Divine offices celebrated in the domestic chapel when and as often as the family should be at their manor of Bramshill. In the cellars are still to be seen some groined arches of about this date, and in building the new mansion the foundations of the old walls were utilised. The present house was erected 1605-12. The author "is said to have been John Thorpe," but this is tradition only. He is not really known to have been at work after the year 1600. But if he did not actually build the house, he may have left behind him the design for others to carry out. This is a point which is worth a little further investigation. The house is truly described as being in Thorpe's manner, though not entirely so. It is most valuable as an architectural monument, apart from its other merits, in that it marks exactly the fusion of the ancient and the modern systems,—the expiring Mediævalism and the incipient art of Italy combining to make what was an essentially native style,—our admirable English Renaissance. This is well seen in the ground-plan, where the classical love of regularity in the fenestration is indulged in at the expense of the internal arrangements, an original wall of the principal staircase dividing a bay window into two vertical sections, and leaving half a window in the dining-room, having been admitted by the architect, rather than disturb the symmetrical character of the façade. The hall is of the older type, and has its screens; the entrance is not, however, in the traditional place, but in the middle of one side; and we miss the great feature of earlier domestic buildings,—the great hall bay window. That most delightful of all apartments, the gallery of Elizabethan plan, is here in ample dimensions, 120 ft. long and 20 ft. wide, if the scale may be trusted. The staircase had been despoiled and a poor Georgian affair substituted for it; but it is believed that the staircase at Eversley Manor House was originally at Bramshill, and it has now been restored to its old position. The house is built of brick with dressings of Headington stone, and its general aspect is grave and serious,—too much so, indeed, we should be inclined to say, to have been the work of Thorpe. There is an entire absence of all fuss and dodginess; the parapets are pierced and of the usual design employed in houses of its date, and the entrance has flanking pilasters of the Jacobean type, and a projecting circular oriel above the archway. Freestone is but sparsely used, especially in the jambs of the windows and doors, which are treated in some instances almost as if the intention were to give the effect of an Italian Renaissance "Architrave." There is, however, over the whole a dignity and grace which hitherto our modern architects have failed to catch, or have caught only in few cases, and as if by a happy accident rather than as a result of art. The modern tendency is to overdo everything, and there could be no better corrective of such a spirit than a careful study of the sources of the effect of this excellent example of quiet sober Old English work.

It is a comfort to be able to write that the old house is well cared for, and that by the judicious treatment it has received and is receiving its life may be prolonged for centuries. It has had its vicissitudes, but it has also had its escapes; for it was untouched by the civil contentions of the century of its birth, and emerged unscathed from the troubles which laid its near neighbour, Basing House, in ruins.

We desire to thank the owner for this beautiful record of an interesting and beautiful house; the illustrations to his book are photographs printed by the Woodbury process and therefore permanent, and the architect and archæologist will be grateful for the details of doors, window mullions, parapets, &c., with which the work is adorned, and which help the professional reader to a just estimate of the true character of the building.

The contemporary painter's bill for the decoration of the mansion is printed at length, and is interesting as showing that the quiet greys and subdued tones which endear these old houses to us were not qualities which suited the taste of their day; for the mullions and other stonework were painted *white*, and the casements *red*, and the whole effect must have bordered closely upon the gaudy. In this, however, the Mediæval manner was continued; for we know that early buildings were whitewashed or painted, and even in some cases gilded. An almost childlike love of bright positive colour distinguished our forefathers, and we alone of all the world are persistently sombre and grave in our surroundings.

A line in the aforesaid bill has perplexed Sir William Cope a good deal. It runs:—"For working [elsewhere rendered "paintinge"] of the waynscott in the tower roome after the Chene hanging, 16*l*." This he reads "in the tower roome *with* the Chene hangings." We would, however, suggest as a contribution to the inquiry, that "*after*" should here be read "*in the manner of*," and that the "Chene hanging" was a model to be followed by the painter; 16*l*. (equal to 112*l*. of our money) would have been a monstrous charge for merely painting the wainscot below the tapestry in a "tower roome," which would be of necessity a small room; but it is a more reasonable charge if the painter's work consisted of "some pretty slight drollery, or the German hunting, in waterwork (*i.e.* distemper)," in the wainscot panels, a form of decoration which was, as we know from Sir John Falstaff, superseding "those old flea-bitten tapestries." Chene may have stood for "cheyney," or have indicated the *locale* of the original; at any rate, the above clue may be worth following up, and, by its aid and a further examination of the family archives, the "mystery of the Chene hanging" may yet be unravelled.

It is the opinion of so good a judge as Mr. Fergusson that the previous house resembled Oxburgh in its general plan and arrangements. We had the good fortune to see Oxburgh last autumn and to admire what is left of the old structure. The "hall" has vanished. What would we not give,—what would its present owner not give,—if some of his predecessors had done for Oxburgh what Sir William Cope has now done for Bramshill? Let the hint be taken by all whom it concerns. They will do themselves honour and posterity a service by compiling for their several houses and their contents such a complete and intelligent record as that we are now reviewing.

In conclusion, Bramshill has a ghost, of course; but, better still, it is said to be the scene of the "Old Oak Chest" tragedy, and the chest itself was removed,—no one knows whither,—by the widow of Sir Denzil Cope, who died in 1812.

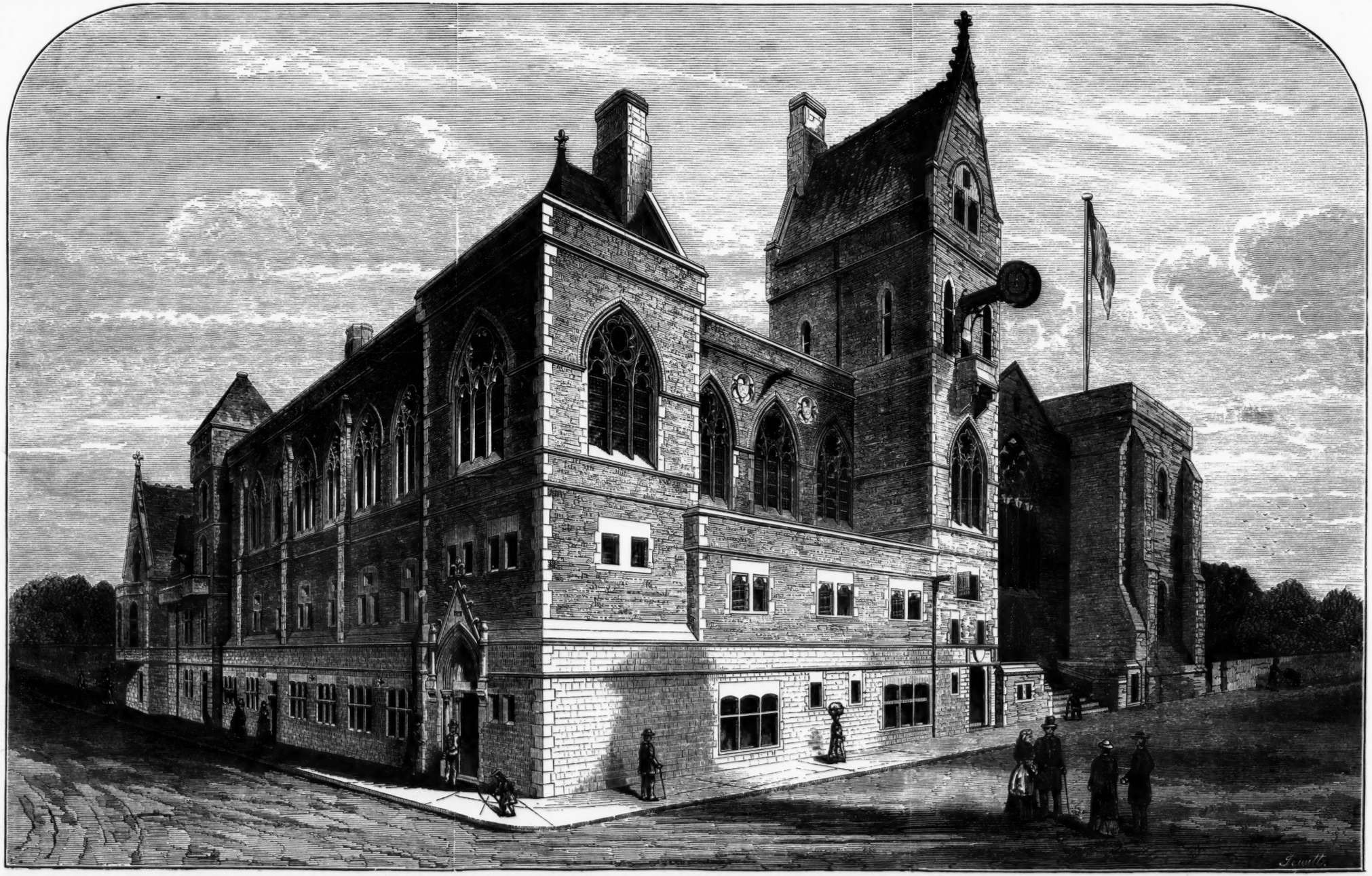
Our author inclines to the belief that the story is a fiction, or, at any rate, that Bramshill is *not* the scene of its occurrence. Wherefore? He owns that it *may* have happened to one Elizabeth, daughter of the sixth Baronet, buried at Eversley in 1730, and that her cousin Sir Richard, who probably knew all about it, was "a man of very peculiar disposition," and may have purposely maintained a moody reticence on the sad subject. Then, why pronounce positively against the tradition? Sir William Cope will forgive us if, while taking our leave of his agreeable book, which only lacks an index, and perhaps an index map, for which the 6 in. Ordnance Survey is conveniently available, we prefer to abide by the common belief of the locality, and as an additional piece of romantic interest to associate his splendid inheritance with one of the saddest episodes in the history of honourable but unfortunate love.

* Bramshill: its History and Architecture. By Sir William H. Cope, bart. London: H. J. Infield.

THE BURNING OF THE RATHHAUS TOWERS AT AIX-LA-CHAPELLE.

IT is a common saying that "they do these things better in France." Now, however inferior we may be supposed to be by some people to the French, we may certainly pride ourselves in being immensely in advance of the Germans in our methods of extinguishing fires when they break out in our towns. Notwithstanding what we have to say of some individuals who appear to have acted with good sense and courage, we have little hesitation in asserting that such a scene of muddle and confusion as that witnessed at Aix-la-Chapelle could scarcely have taken place in any English village, to say nothing of a large and important city.

If we may believe a writer in the *Germania*, no decided effort was made to extinguish the fire which broke out in one of the narrow streets surrounding the town-hall, until several houses and the town-hall were noticed to be on fire. The writer says that one good common-sense woman extinguished the fire, which had broken out in one of the houses, by emptying the contents of a tin jug upon it two or three times, showing how easy it would have been to extinguish the conflagration if it had only have been taken in time; but, wonderful to relate, although smoke was seen rising from the "Granusthurm," or eastern steeple of the town-hall, nothing whatever was done to "extinguish the fire for over twenty minutes!" The good old woman with her tin jug would have settled the matter in a few seconds, but the whole force of German officialism, with its cumbrous police arrangements, was evidently struck all of a heap by a fire breaking out in a town-hall: so for twenty minutes no efforts whatever were made to save this magnificent old structure, while the German police, firemen, and Government officials were looking on. The Granusthurm burst out into flame, the streams of molten copper and lead pouring down in all directions, until, at last, with an immense crash, the great bulbous spire fell in, setting fire to the roof of the Kaisersaal, which occupies the space between the two great towers. Now, will it be believed that a large force of military and police were present, but that, instead of making any attempt to save the noble old Rathhaus, or *even to extinguish the flames*, they occupied themselves in taking the furniture out of the houses which were not in flames, though it is evident from the writer in the *Germania* that the crowd had absolutely called attention to the fact that the Graunsthurm was in danger of destruction? With such blundering it is by no means wonderful that the other lofty steeple at the west end of the Rathhaus, which stands over the repository for the town records, was soon on fire. The force of the flames was now so intense that this vast spire twisted round and fell headlong into the blazing mass. Twenty



NEW TOWN HALL FOR DOVER.—THE LATE WILLIAM BURGES, A.R.A., ARCHITECT.

other buildings, chiefly private houses, were soon on fire, and the greatest danger was anticipated for the wonderful old cathedral, the ironwork upon the roof of which was red hot. The fire, however, which up to this time appears to have received little check at the hands of man, did at length meet with an obstacle raised by hands which have for five centuries gone to their rest, and this was the splendidly-constructed vaulted roof of the Kaisersaal, which resisted the force of this burning furnace, the streams of molten lead and copper, the fall of the timber spires, and all the other dangers. It is simply wonderful the safety which a vaulted roof is to a building. The cathedrals of Chartres and Rouen, and the choir of Canterbury, would have been reduced to ruin by fire but for their roofs of stone. York Cathedral has been twice reduced to ruin through its roof vaulting being composed of timber. Judging from Hollar's view of Old St. Paul's, the vaulting over the nave of that church appears to have been constructed of wood, and this may account for its destruction in the Great Fire of London.

When the old Houses of Parliament were burned down, everything was destroyed, except the cloisters and crypt of St. Stephen's Chapel, and these were the only portions of the building which were vaulted in stone.

That the Kaisersaal at Aix-la-Chapelle owes its safety to this cause alone need scarcely be a matter of doubt; for every single thing that could be burned was burned until the fire met with this obstruction. And does this not caution us that no public building is safe from the danger of fire without a stone or brick or concrete vault?

When one thinks how comparatively cheap vaulting is, how unaccountable is the fact that in England we hardly ever make use of it, even in our churches!

But for this stone-vaulted roof not only the Rathhaus at Aix-la-Chapelle, but the cathedral,—nay, the whole town,—might be now a heap of ashes. We should strongly recommend the good people of Aix-la-Chapelle to vault even their private houses with brick or stone, because if the intelligent officials whose duty it is to put out fires stand by and look at a public building burning for twenty minutes or half an hour without its striking them that a little water might be of use, it is highly probable that a good deal of burning may take place in the fine old city, and they cannot always trust to having the good old lady with her jug at hand. Our readers will scarcely believe that this fire at Aix-la-Chapelle broke out at two o'clock in the afternoon, so that it was immediately discovered, nor will they wonder less when we tell them that the very writer in the *Germania*, who has given such a graphic account of the matter, absolutely warned the authorities of the city only eight days back of the great danger of such a catastrophe and of the inefficiency of the arrangements to avoid or subdue it. We trust, however, that the very severe lesson which the authorities of the town have received may not only make them more vigilant and careful and more prepared to cope with such an outbreak in future, but that it may also read a lesson to people nearer home. Fires are certain to take place in our towns, and the danger from them does not decrease. On the contrary, the use of mineral oils and other inflammable substances, the luxurious habit of over-furnishing our houses, the rage for light gauzy substances, lace curtains, toilet covers, &c., add not a little to our danger, nor does the flimsy mode of construction adopted by our speculative builders in any way lessen our risks. We have seen an old half-timber house at Wurzburg on fire, which, after three days' burning, was only injured as to its roof and upper story, whereas a short time back we saw a "neat and compact desirable brick residence" at Notting-hill burned literally to the ground in half an hour!

We do not think that the regulations with regard to fires are half severe enough, either here or on the Continent. We have frequently seen houses to let in which the hearths are all cracked and broken. Now, every house which has the hearth-stone broken is in danger of catching fire. We frequently find stoves set in such a manner as to leave a deep hole on either side. These holes, which it would not probably have cost the builder 2d. to fill up when the stove was "set," are a serious cause of danger; the soot from the chimney falls into them, and they become clogged, they catch fire and burn for days until at last some spark finds its way to a concealed beam, and in a few hours the house is burned down.

We caution our readers and the public in general whenever they *smell burning in a house* never to rest until they have found out whence the smell proceeds, and, if there is any danger, at once to remove all risk at any trouble or inconvenience.

We have in this notice of the fire at Aix-la-Chapelle taken our view of the case from a writer in the *Germania*, and, of course, do not vouch for all the facts which he states; but as he was evidently a spectator of the scene, as he writes with a thorough knowledge of the subject, and, moreover, as he had previously cautioned the authorities to expect such a catastrophe, the result of which has fully justified his forebodings, we cannot help thinking that there must have been a great absence of proper precautions against the outbreak of fire, and a most unwarrantable delay in making the most ordinary attempts to extinguish it. Knowing, as we do, how well-trained the members of the German fire brigades generally are, we do not doubt that when they were called out they did their duty; but either their machinery must be cumbrous and out of gear, or something must have been wrong somewhere to cause such an unacccuntable delay. We rather fancy that the unwieldy system of German officialism and "red tape" may in some way account for it. We have all heard the story of the king who was burned to death because "the courtiers could not settle amongst themselves whose duty and office it was to put out the flames." Possibly something of the same kind may have taken place at Aix-la-Chapelle.

LIGHT AND AIR.

THE committee of the Institute of British Architects appear to be still prosecuting their labours. Mr. E. S. Roscoe, barrister, who has been recently added to the committee, has addressed the following memorandum to the special committee on light and air:—

"The following observations appear to strengthen the opinion on this subject which was stated in my previous memorandum. It was fully shown in the paper prepared by Mr. J. L. Goddard that the Prescription Act was passed through Parliament without the question of the right to light being discussed in either House. I have looked with some care both at the first report of the Royal Commission of 1828, on which the Prescription Act is based, as well as at most of the evidence laid before the Commission. I do not find that the question of the right to light is specially discussed either by the Commissioners or by the witnesses. It does not seem to be treated as a question apart from any of the other subjects to which prescription by common law applied. Coupling this, therefore, with the fact that the question was not discussed in Parliament, it seems to me to follow that the Act was passed, so far as regards the right to light, without there being any reason for it, and without any consideration of its probable consequences. It seems, in fact, to have been like some more strictly political measures,—quite a leap in the dark; and there appears no reason why the mere fact of such a measure being in the Statute Book should be any argument against its repeal, having regard to the circumstances under which it became law. I venture also to think that the state of the law in regard to prospect is not without some valuable bearing on the subject. As is well known, no action will lie for the interruption of the prospect of a house, however much the value of that house may be lessened by such an interruption. More than once has this question been tried, and in refusing the aid of the Court of Chancery in 1752, Lord Hardwicke said: 'It is true that the value of the plaintiff's land may be reduced by rendering the prospect less pleasant, but that is no reason for hindering a man from building on his own ground' (Fishmongers' Co. *v.* East India Dock Co., 1 Dickens, 163). Again, in another and similar case, the same judge said, if he granted the plaintiff's prayer 'there could be no great towns, and I must grant an injunction to all the new buildings in this town' (Attorney General *v.* Doughty, 2 Vesey Sen., 453). But the same reasons which prevent an injunction being granted in the case of an interruption of a prospect are equally strong in the case of an interruption of light. In each case building operations would be, or are, interfered with, and if it is unadvisable to interfere with a man when he lessens the value of neighbouring property by interrupting a prospect, I fail to see why he should be interfered with when he interrupts a light. It is true that as the law now stands an enjoyment of the light for twenty years gives additional value to the property which has had such enjoyment, but this is no reason against a discontinuance of the law, but merely one in favour of respecting vested rights. The exact similarity between prospect and light may be seen if we bear in mind that A may be the owner of a residence with a prospect, not of a distant kind, but with one which may be of enormous value to his house, and that B may come and deprive him of it altogether, and depreciate the value of his property to a very great extent. On the other hand, A may have a building, one room of which has an indefeasible right to the light, and, if B comes and erects a valuable building opposite the windows of this room so as to darken it substantially, he may be prevented from erecting his building, or have to pay a pecuniary fine if he wishes to continue his operations.

Temple." E. S. ROSCOE.

INTERNATIONAL EXHIBITION AT NICE.

THE sanitary condition of the Riviera is a matter of such vital importance to the thousands of British subjects who annually visit that enchanting locality in search of health, that the sanitary and medical section of the exhibition which is to be opened at Nice in December next assumes unusual importance. The Mayor and Municipality of Nice have taken wise measures for the organising of this Exhibition; and they ask especially for the co-operation of all whose occupations make them familiar with sanitary needs, and whose efforts are constantly directed to supply them; such as engineers, architects, manufacturers of sanitary apparatus, pharmaceutists, and the makers of meteorological and other instruments. A circular recommending the Exhibition to support, and signed by twenty-four of our best known physicians, professors of hygiene, sanitary engineers, meteorologists, and medical jurisprudents, has been issued, having been drawn up and approved at a meeting held at the House of the Society of Arts on June 26, 1883. Messrs. J. M. Johnson & Sons, of 1, Castle-street, Holborn, have been appointed official agents for Great Britain; and to them application for space must be made, and from them all information can be obtained. The programme of the sanitary section of the Exhibition is a full one.

THE INSTITUTION OF CIVIL ENGINEERS.

PREMIUMS AWARDED.

THE Council of the Institution of Civil Engineers have awarded the following premiums:—

For Papers read at the Ordinary Meetings.

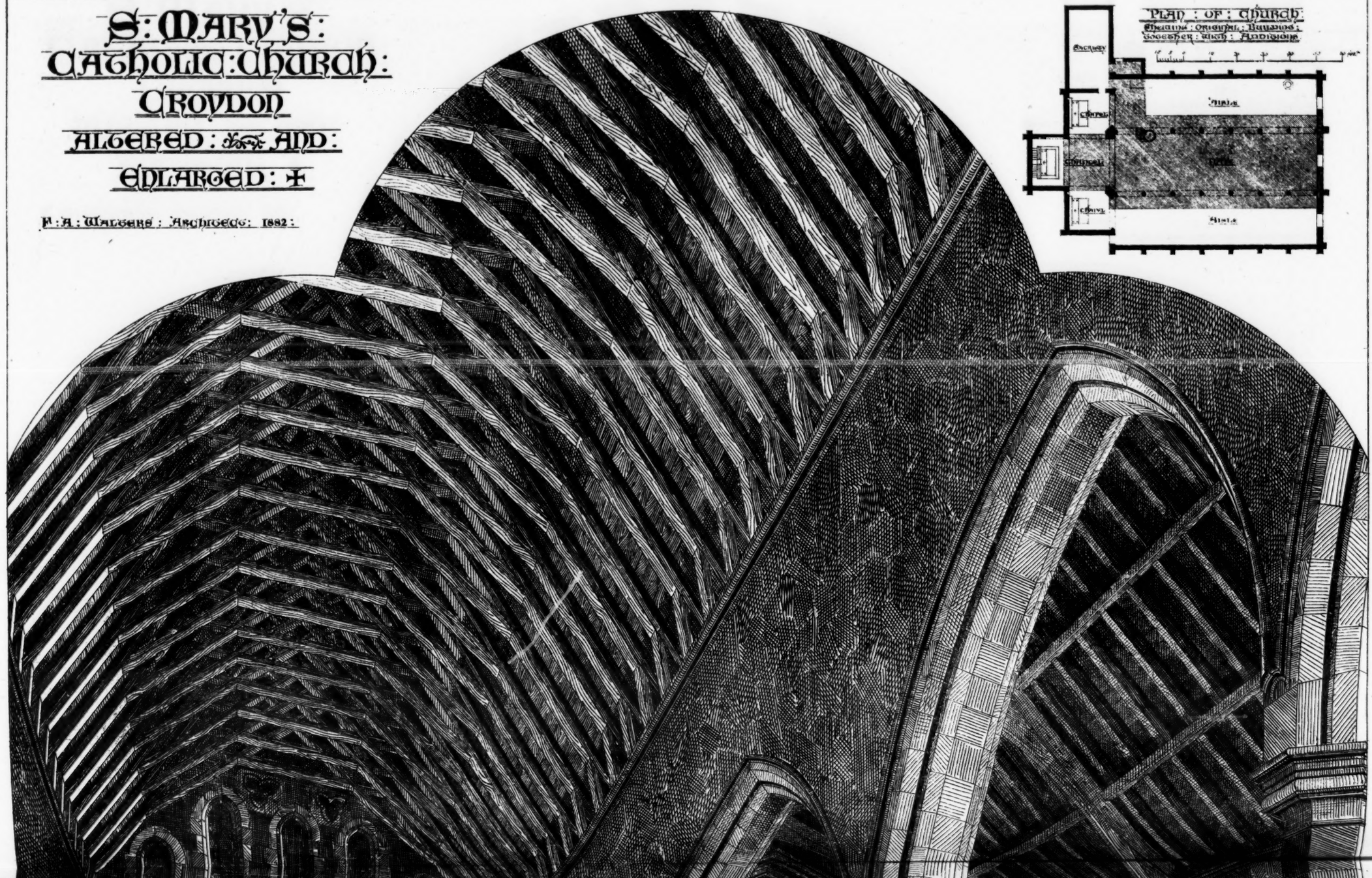
1. A Telford Medal and a Telford Premium to Ralph Hart Tweddell, M. Inst. C.E., for his paper on "Machine Tools and other Labour-saving Appliances, worked by Hydraulic Pressure."
2. A Telford Medal and a Telford Premium to William Anderson, M. Inst. C.E., for his paper on "The Antwerp Waterworks."
3. A Telford Medal and a Telford Premium to Major Allan Joseph Champneys Cunningham, R.E., Assoc. Inst. C.E., for his paper on "Recent Hydraulic Experiments."
4. A Telford Medal and a Telford Premium to Alexander Leslie, M. Inst. C.E., for his paper on "The Edinburgh Waterworks."
5. A Telford Premium to John George Gamble, M A., M. Inst. C.E., for his paper on "The Waterworks of Port Elizabeth, South Africa."
6. A Telford Premium to Patrick O'Meara, M. Inst. C.E., for his paper on "The Introduction of Irrigation into New Countries, as illustrated in North-Eastern Colorado."
7. A Telford Premium to William Morris, M.Inst.C.E. (of Deptford), for his paper on "Covered Service-Reservoirs."
8. A Telford Premium to John Fernie, M.Inst.C.E., for paper on "Mild Steel for the Fire-boxes of Locomotive Engines in the U.S.A."
9. A Telford Premium to John Daglish, M.Inst.C.E. for his paper on "The Sinking of Two Shafts at Marsden, for the Whitburn Ccal Company."
10. The Manby Premium to Thomas Bell Lightfoot, M.Inst.C.E., and John Thompson, for their paper on "The Design and Construction of Repairing Slipways for Ships."

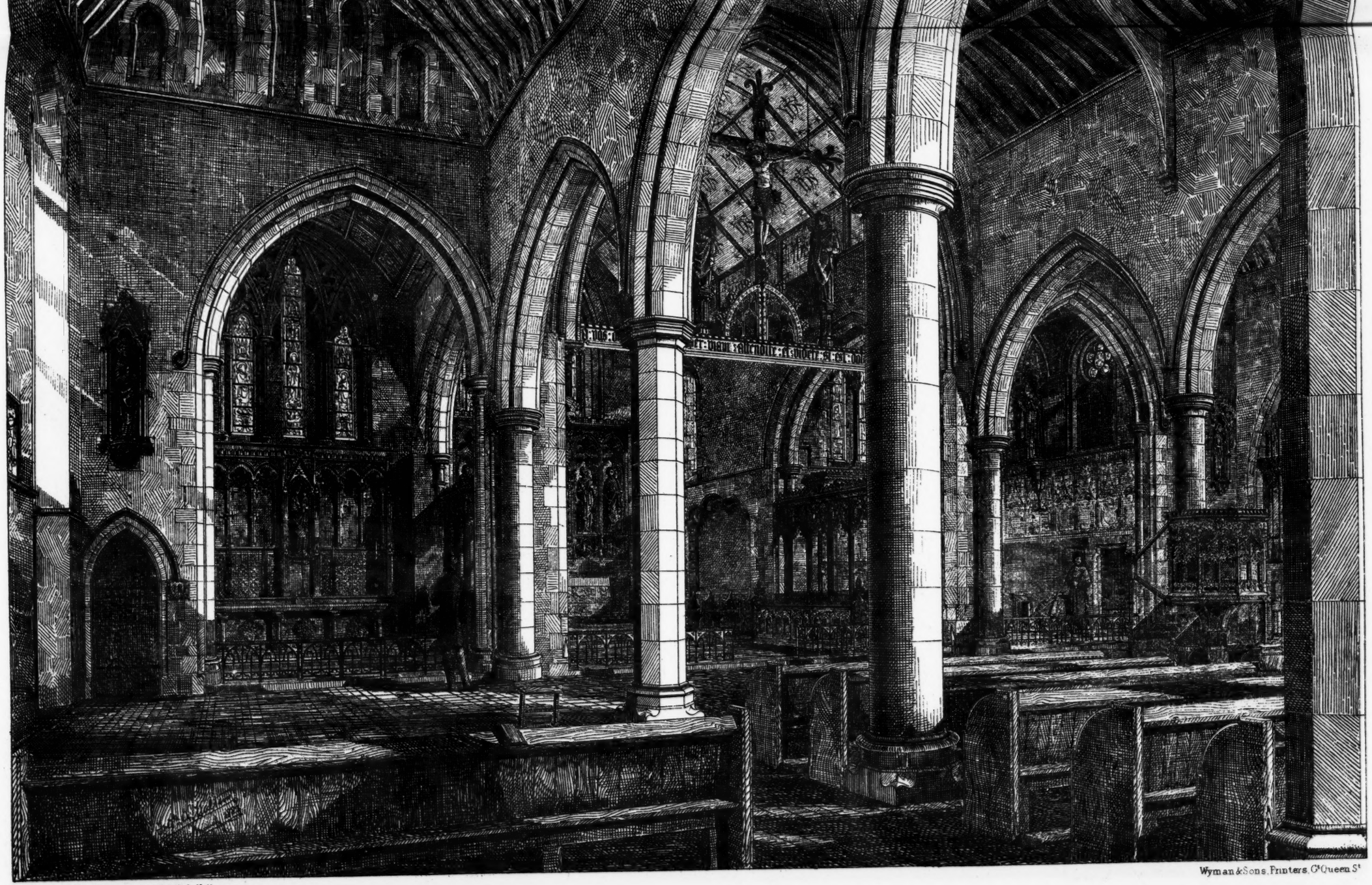
The Noel Park Estate, Wood-green.—"The Artisans', Labourers', and General Dwellings Estate," recently illustrated in our pages, has just been named, after the company's chairman, the "Noel Park Estate, Wood-green." We are asked to mention this as giving a more precise idea of its position.

S: MARY'S: CATHOLIC: CHURCH: CROYDON ALTERED: AND: ENLARGED: ✝

F: A: WALTERS: ARCHITECT: 1882:

PLAN: OF: CHURCH
SHEWING: ORIGINAL: BUILDING: TOGETHER: WITH: ADDITIONS





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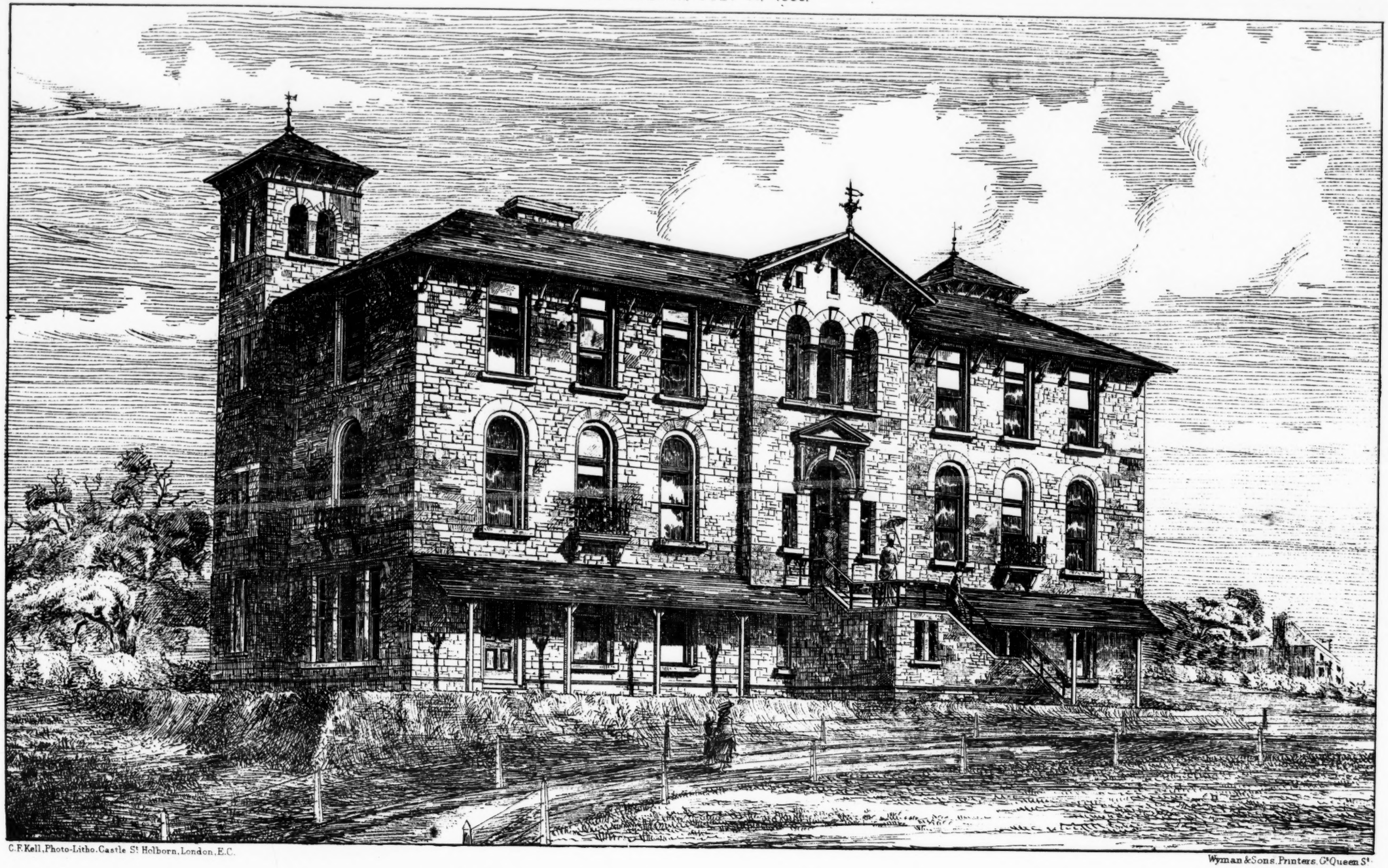
Wyman & Sons, Printers, Cr Queen St



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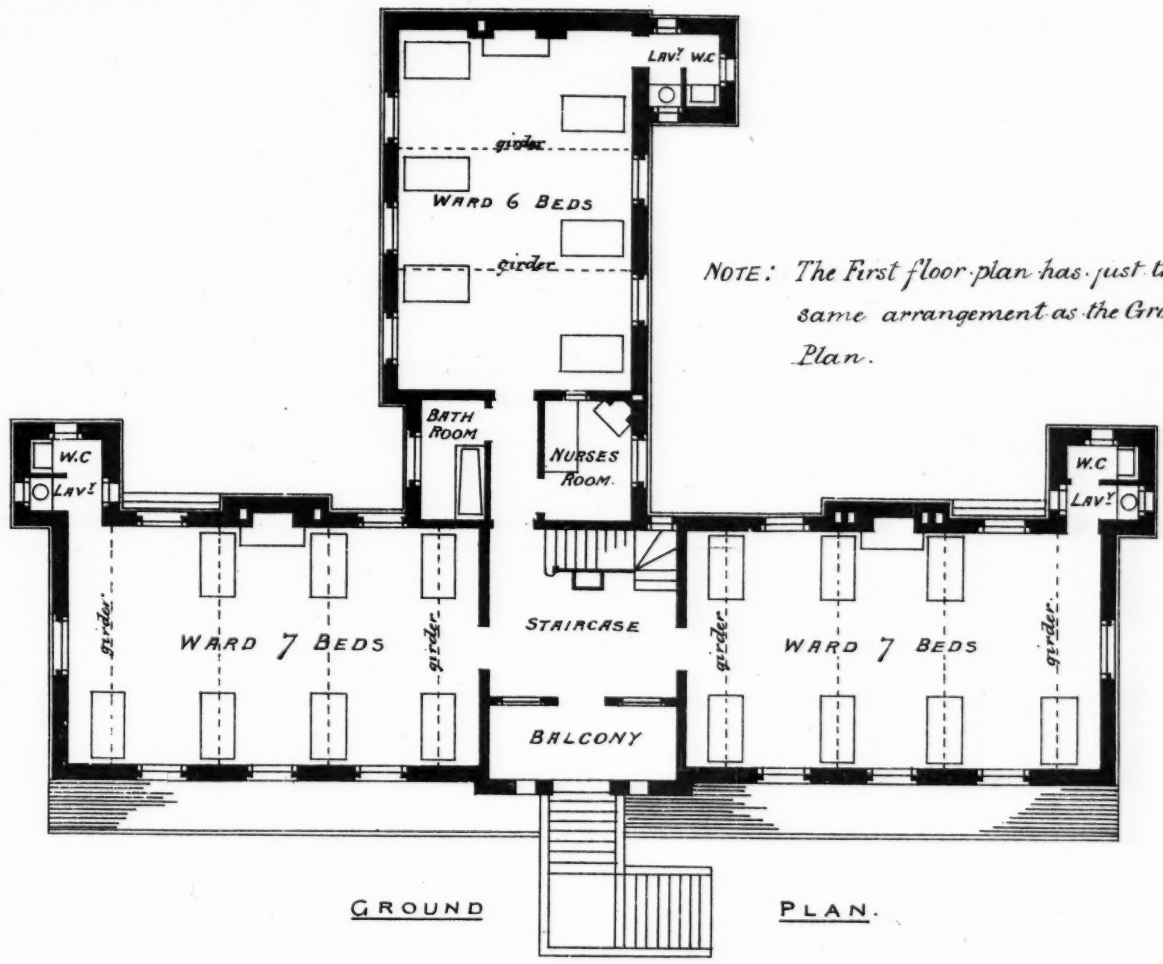
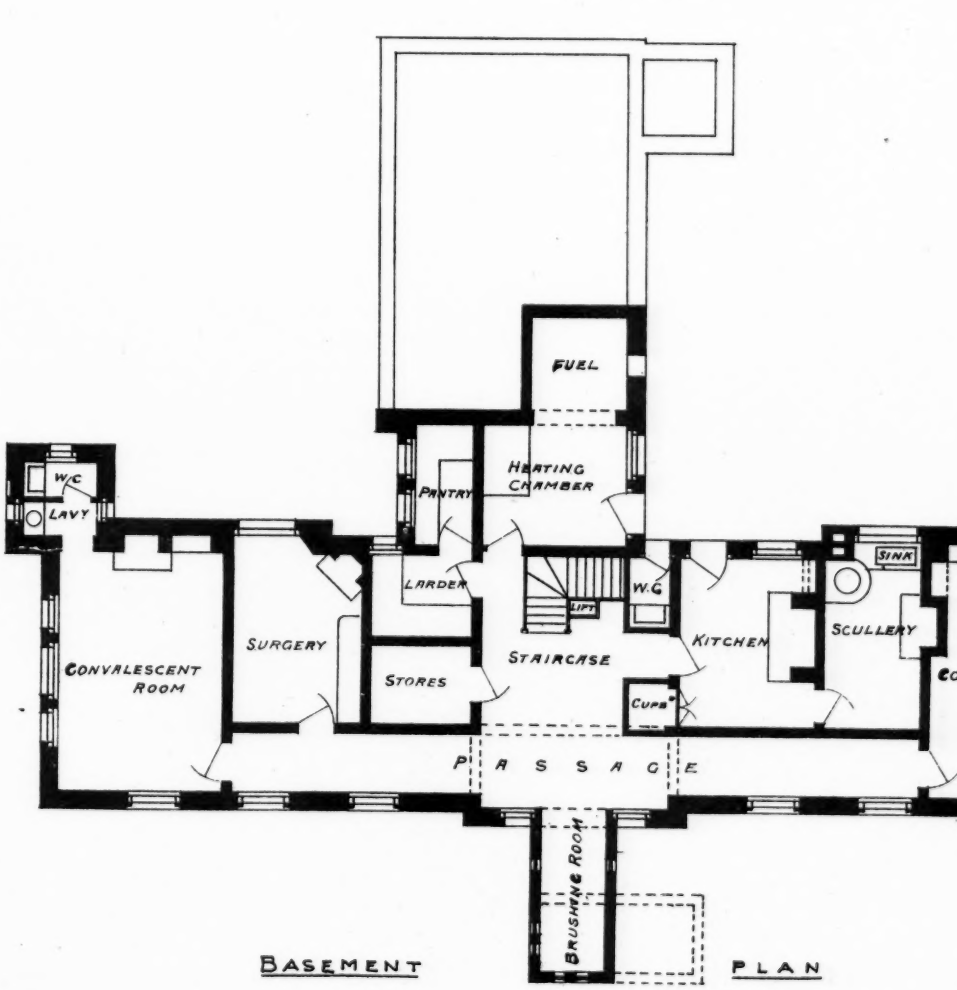
SANATORIUM AT REEDHAM.——PROFESSOR T. ROGER SMITH, ARCHITECT.

SANATORIUM AT REEDHAM



NOTE: The First floor plan has just the same arrangement as the Ground Plan.

GROUND PLAN.



BASEMENT PLAN

10 5 0 10 20 30 40 50.

SCALE OF FEET.

Prof. T. Roger Smith.
Arch.t & Surv.r
10 Lancaster Place
Strand W.C.

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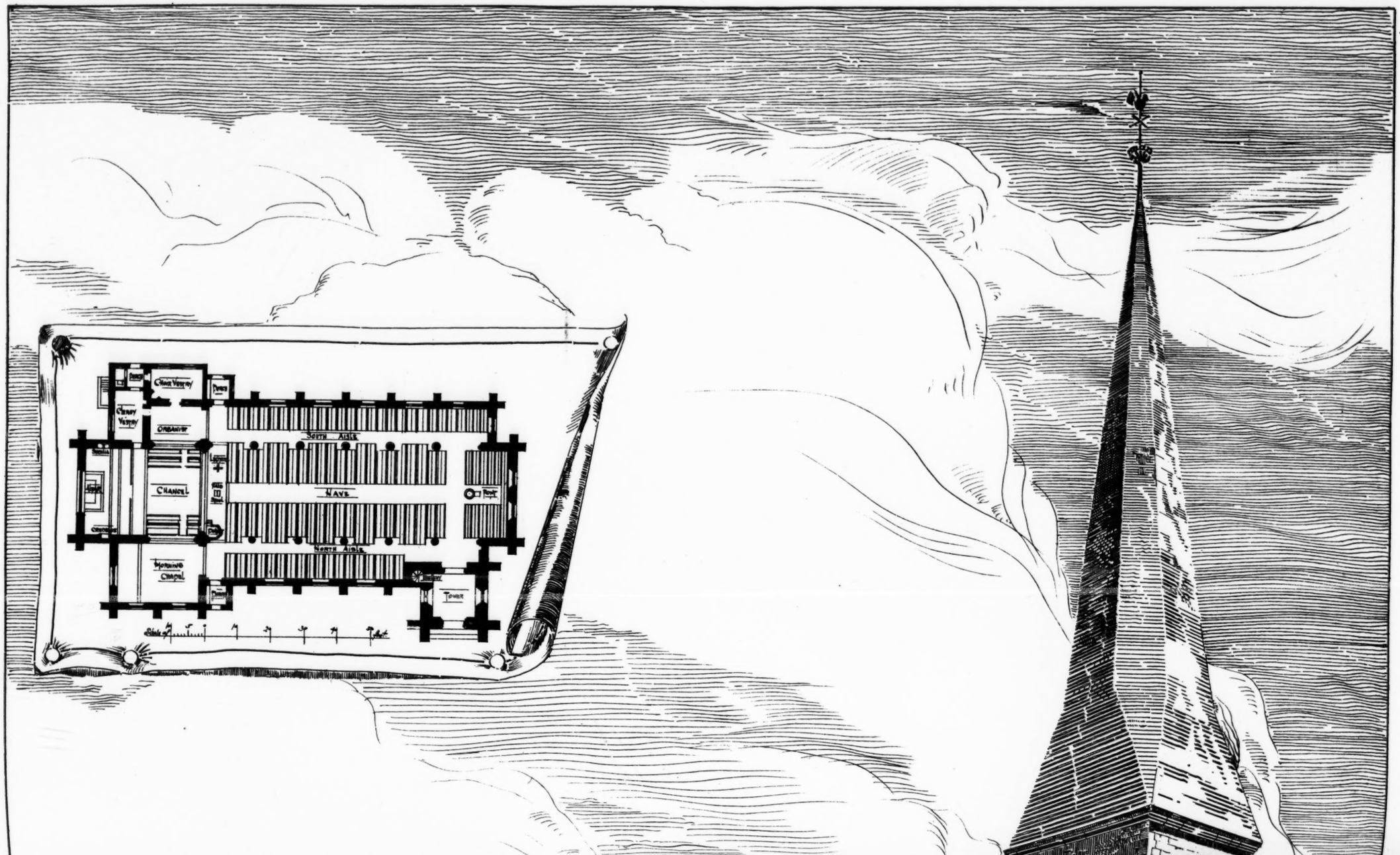
CHOIR VESTRY
PENCE VESTRY
ORGAN
CHANCEL
SOUTH AISLE
NAVE
NORTH AISLE
MORNING CHAPEL
TOWER

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PROPOSED CHURCH, WESTGATE-ON-SEA, THANET.——Mr. C. N. Beazley, Architect.

DOVER TOWN HALL.

THE Maison Dieu at Dover, an oblong hall built at the end of the thirteenth or beginning of the fourteenth century, for the reception of distinguished visitors and pilgrims, was until lately used as the Town-hall. It was also a vestibule to the Council Chamber and Court-house, the modern Gothic apartments being in execrable style. In 1880 the Mayor and Corporation, finding the accommodation afforded by this hall inadequate, called in Mr. Burges to advise them about the erection of a new set of municipal buildings. He proposed the construction of a much larger hall to run parallel with the existing structure, with Mayor's Parlour and other public offices, on the site of a large prison which then existed adjoining the Maison Dieu. At the time of Mr. Burges's decease he had prepared plans for this new Town-hall, which have been carried out according to his original intention, under the direction of Mr. R. P. Pullan. The new hall is 90 ft. 9 in. in length by 57 ft. internally, and is situated at the junction of two streets running at right angles, High-street and Ladywell. There is a low ground-floor, occupied by offices, a spacious kitchen, and caretaker's rooms.

The hall and other principal apartments are on the first floor, approached by short flights of steps in the two angles of the shorter front of the building facing High-street. These staircases are carried up higher to give admission to galleries which occupy three sides of the hall. One doorway is in High-street, and the other in Ladywell. The hall itself is divided longitudinally, and two rows of iron columns support the galleries and the roof. The central division is 36 ft. wide, those at the sides are 10 ft. 6 in. At the end between the staircases there is a third gallery, supported by three stone arches. This hall, which will hold 1,200 people seated, is well provided with means of exit and entrance, as there are no fewer than twelve doorways, most of them opening outwards. The ceiling over the galleries is groined in wood; that over the central division is flat, with panels at a level with the summit of the groining. There is an arched recess at the entrance opposite the staircase, occupied by a rostrum, and above it a stone gallery for speakers. Beyond the hall, on the first floor, there are a mayor's parlour, and judges' and witnesses' rooms.

Externally the building is treated in a very picturesque manner. The style is Geometrical Decorated. Adjoining the Maison Dieu, in High-street, there is a lofty clock-tower, with a gabled roof, 93 ft. high. This front is 63 ft. in width, and, between the staircases, has three three-light windows with geometrical tracery, lighting the hall over the gallery at this end. The total length of the edifice on Ladywell side is 162 ft. Seven similar windows to those on the front mark the extent of the hall. Beneath them there is a like number of two-light square-headed windows, lighting the hall beneath the side galleries. A low square tower stands at the end of the hall, dividing it from the offices, and a gable, beneath which there is a bold bay window finishing the building on this side.

The walls, up to the height of the string course, are constructed of Kentish rag; above that, of flint work. The dressings to the windows and doors are of stone. A sculptured figure of St. Cecilia occupies the tympanum over the door in Ladywell, and over the door of the speakers' gallery is the device borne on the Seal of Dover, viz., St. Martin dividing his cloak with a beggar. This, and the other sculptures, were executed by Mr. Nicholls, of Lambeth.

The edifice is decorated with colour throughout in the style adopted in Mr. Burges's own house in Melbury-road; that is to say, the walls of the hall are of cream-colour, with red lines and quatrefoils, and other figures in the tympana and spandrels.

The ceiling is painted with foliated patterns in red and grey on the natural wood. The mayor's parlour is decorated in a similar manner, with the addition of figures of the Virtues in arched compartments. The decorations were executed by Messrs. Campbell & Smith. The warming apparatus and lighting were carried out by Mr. Phipson. Mr. Stiff, of Dover, was the contractor for the whole of the works, which cost a little under 17,000*l*. Mr. Lonsdale has in hand the first of a series of stained-glass windows, representing Wardens of the Cinque Ports from the earliest times.

PROPOSED CHURCH, WESTGATE-ON-SEA.

THE above church has been designed to meet the requirements of this growing watering-place. If the building is carried out, it will seat 650 persons. The materials are to be Kentish rag, with Bath stone dressings, and the walls inside are to be lined with Hassock. The architect is Mr. C. N. Beazley.

ST. MARY'S (R. C.) CHURCH, CROYDON.

THIS church was re-opened last October, after being almost entirely rebuilt and very considerably enlarged by the addition of two wide aisles, terminating in side chapels; large addition to chancel, and new sacristy, with schoolroom below. The aisles are lofty, and have gabled roofs of unvarnished pitch-pine. The nave roof is very slightly higher, and is the original roof of the church somewhat curtailed by the substitution of the stone arcade in place of the wooden posts formerly existing. The whole of the interior ashlar work is executed in Beer stone; the internal tracery to the windows of the side chapels being supported by columns of grey Belgian granite, much resembling Purbeck marble. Externally, the building is of stock brick, with dressings of Box-ground Bath stone, the roofs being covered with green slates. The style of the church is English Thirteenth-century, but the pulpit, rood-beam, and other woodwork are of Perpendicular character. The architect was Mr. Fredk. A. Walters, of 4, Great Queen-street, Westminster; and the work was satisfactorily carried out by Mr. Samuel C. Parmenter, of Braintree, Essex. Accommodation is now provided for about 800 persons, and the cost, including the altar in the Lady-chapel and other fittings, has been about 4,400*l*.

A substructure to the whole church, of a height of 13 ft., was necessitated by the site having been formerly a gravel-pit, and thus the work has been more costly than it would otherwise have been.

THE SANATORIUM AT THE REEDHAM ASYLUM FOR FATHERLESS CHILDREN.

THIS building has been designed and erected chiefly with the intention of affording a means of isolating any cases of contagious or infectious disease which may break out among the inmates of this asylum; though other cases of sickness may be treated in its wards, if they arise.

The site is in the grounds of the asylum, but apart and at some distance from, the other buildings, and was selected by the medical officer of the asylum, Dr. Diver, in consultation with Dr. Carpenter, of Croydon, and the architect. The two medical men also drew up a memorandum of the requirements, which have been carried out in the design of the building. Sick-wards were to be provided, each of moderate size, so as to afford the means of isolating three different sets of cases on the girls' side, and as many on the boys' side, should various diseases unfortunately present themselves at one time. Accordingly, a three-story building has been built, giving three wards on the first floor and three on the second floor, with one bath-room and nurse's room common to each group. The ground-floor is appropriated to administrative rooms, day-rooms, &c. The materials used are Kentish rag, with brick backing for the walls, and Tisbury stone for the dressings.

The general contractors were Messrs. Higgs & Hill. The heating apparatus is by Messrs. Haden, of Trowbridge.

The architect was Professor Roger Smith, and the architect's son, Mr. R. E. Smith, acted as clerk of works for the Governors.

The Channel Tunnel.—At the meeting of the Channel Tunnel Committee on the 10th inst., the Channel Tunnel scheme was rejected by six to four. Lord Lansdowne, who presided, having read his report for the first time to the committee, which was strongly in favour of the scheme, six other reports were read by members of the committee. Lord Lansdowne's report was thereafter read a second time, and on a vote being taken was rejected by six to four, Lords Lansdowne and Aberdare, and Messrs. Arthur Peel and Baxter voting for, and Lords Shute, Devon, and Camperdown and Sir Hussey Vivian, Colonel Harcourt, and Sir Massey Lopes against the scheme.

THE PRINCIPLES OF HOUSE DRAINAGE.

PARKES MUSEUM.

MR. ROGERS FIELD, C.E., who delivered the evening lecture at the Parkes Museum on the 5th inst., gave a description of the new system of drainage carried out at the Museum, with a demonstration of sanitary appliances in action. Before doing this, however, he explained the main principles which should govern house drainage, and gave a few illustrations of the application of those principles. He remarked that Professor Tyndall, in the speech he delivered at the opening of the Museum, said that "the scientific mind, and, indeed, the general healthy human mind, dislikes confusion; it loves unity and order, and unity and order in science are impossible until we have illuminated the field of facts with the light of principles." Now those observations were peculiarly applicable to the present subject. One great peculiarity of house-drainage was the very important part played by details. In fact, whether a house was healthy or whether it was extremely unhealthy often depended upon how some apparently insignificant detail of the drainage had been carried out. It was therefore essential that we should be able to judge what details were right and what details were wrong. Now, the details in connexion with house-drainage were so numerous, especially when we took into account the various kinds of sanitary appliances, which had greatly multiplied of recent years, that it was almost impossible to avoid getting confused about them unless we had clearly impressed on our minds the principles which should govern the details. The sanitary principles applicable to house-drainage were exceedingly simple, but this, which would at first sight appear to be an unmixed advantage, was not altogether so. The very simplicity of the principles caused them to be neglected, as people were inclined to think that they were so self-evident that it was quite unnecessary to consider them. That was, however, a great mistake, as the principles were of vital importance, and could not be too strongly impressed on people's minds. They might be briefly stated as follows:—

1. All refuse matter must be completely and rapidly removed from the house.
2. There must never be any passage of air from the drains or waste-pipes into the house.
3. There must be no connexion between the drains and the domestic water supply.

The lecturer proceeded to enlarge upon these principles separately, giving illustrations of each of them. The first principle, that "all refuse matter must be completely and rapidly removed from the house" was the most important and, at the same time, the most neglected of the three principles. It went absolutely to the root of sanitation. If it were really carried out in its integrity there would be no leaky drains, no polluted subsoil, no production of foul gases in the drains from decomposing filth. The chief agents in the removal of refuse matter from houses were drains, and these had been divided into two classes, viz., self-cleansing drains and drains of deposit. It might at first sight appear strange to talk of a "self-cleansing" drain. Many people looked on drains as things which were in their very nature dirty and must always be so, and thought that as long as drains did not stop up they were necessarily all right. That was quite a mistake. Of course there was often a slight film of dirt adhering to the sides of the drains, but if matters were properly arranged there ought not to be any deposit; in fact, the existence of deposit was a sure indication of some defect. If the drains were really sufficiently well laid there would be no deposit at all unless the fall was insufficient. Where the fall was insufficient, and where such insufficiency could not be avoided, there ought to be provided the means of properly flushing the drains, not once a week or once a month merely, but regularly every day, and the means of flushing adopted should be automatic in action. There were several automatic appliances for flushing now before the public, and their use had been found to be extremely beneficial and effective. As to the way in which drains should be laid, the only way to see whether drains were well laid was to test them. A usual practice in the best work now was to lay the drain in a straight line, and to look along the inside of it in order to see that the joints were properly made. Such joints were at one time very commonly made of clay, which was still used in many cases, very im-

properly. The joints should at least be made in cement, and no one who understood his business would use clay. A very good water-tight joint was easily and rapidly made by the use of stoneware pipes, fitted with Stanford's patent joint. These pipes were used for the drainage of the Museum, in conjunction with a short length of iron pipe. Ocular inspection of the interior of the drain, though it should always be made, was, however, not sufficient. A drain, to be safely and properly laid, must be perfectly watertight, and no mere inspection could prove it to be so, however satisfactory might be its appearance. It did not do to trust to appearances in such matters. Whatever care might be taken in laying the drain, its condition as to watertightness could not be relied upon unless it were tested. The necessity for some efficient test had of late years led to the adoption of some important rules of practice. One of them, already referred to, was that the drains should be laid as far as possible in straight lines, with means of access for inspection or cleansing (or both) at intervals, especially at points where the drain trended to right or left. This might seem a simple matter, but the adoption of the practice had several very great advantages. For example, if the drain were laid straight like a gun-barrel, a person could look through it from end to end, and have ocular demonstration whether it was truly laid. But it was also important to ascertain that the drain was watertight, and that could not be decided unless the drain were tested. Now the only reliable way of testing a drain in this respect was to plug it up at the lower end and pass some water into it. If the water stood in the drain after allowing a proper interval of time to elapse, the drain was sound; but if the water did not stand in it, it was unsound, *i.e.*, leaky, and the defect should be found out and remedied, even though it might involve the taking up and relaying of the whole drain, for nothing could be more important than that a drain should be perfectly watertight, especially if it passed under a house. No other test than this was to be depended upon. Coming to the question of traps, the lecturer said that a trap was a very important detail in connexion with house drainage. A trap might be defined as an appliance consisting either of a piece of bent pipe or of a chamber with a division or "dip" in it, intended to interpose a layer or "seal" of water as a barrier against the free passage of sewer-air into a house. Now the form of the trap, which might be considered by some an unimportant detail, was really a matter of vital importance. A trap might be made (and too many of them were so made and used) so as to retain foul matter; such a trap was not what a trap should be, for it was a trap of deposit. The old-fashioned square brick-chambered trap, with a stone dip, was emphatically a trap of deposit. It could not help retaining solid particles, which were deposited on the bottom of the trap, and consequently every time water was poured through the trap the deposit of foul matter was stirred up and gave off an offensive smell,—the very evil against which it was intended to guard. Other traps which were condemned by the lecturer as being traps of deposit were the D-trap and the bell-trap. A trap, to be efficient, should be self-clearing, *i.e.*, it should be of such a form as to render the accumulation of solid matter in it an impossibility. The only trap that fulfilled this condition in the highest degree was the round-pipe trap of U or some kindred shape. With regard to the question of water-closets, the lecturer said that as with traps, so with closets, there were good and bad ones, and it was not always the more expensive ones that were the best. People could only judge of the merits of a water-closet by testing it so as to see whether it conformed to the principles he had laid down. No worse closet could be found than the pan-closet, which, in spite of the fact that it was now generally condemned by sanitarians, was still largely used. Its objectionable point was the iron container into which the basin fitted, and into which the pan discharged its contents when the handle was pulled. The "container" was very well named, for it *was* a container,—of filth. Its construction was such that while, every time the closet was used, its (the container's) interior was splashed with filth, it was not possible to efficiently flush it. To make matters worse, it very often had under it a D-trap, the container and the trap together thus forming a double means for the retention of matter which should be at once passed away. With regard to all such defective and improper sanitary appliances, it was of no use to say, "Out of sight, out of mind"; they and their contents might be out of sight, but their evil consequences must make themselves felt in other ways. One of the simplest and best forms of water-closet that could be used was a hopper basin, fitted with an U trap of round section, and provided with a proper flush of water. The hopper and trap should be of such form as to allow the standing water of the trap to come well up into the bottom of the basin, and the latter should be squat rather than elongated in form as in the hoppers which were elongated in form the water in descending would pass downwards in a spiral direction, and so lose a great deal of its flushing-power. What was wanted was a hopper of such form as would permit of every part of its interior being thoroughly washed by the flush. There were several good forms of hopper and other closet to be seen in action in the Museum, and their comparative efficiency could be readily tested by putting a reasonable quantity of paper into them, and noticing the rapidity with which they were able to carry it away. Passing to the discussion in detail of the second of the three principles which he had laid down, the lecturer proceeded to show how the air of the drains could be absolutely excluded from the interior of a house by means of what was known as disconnexion of the house-drain from the sewer. The house-drain, at its fall into the public sewer, being properly trapped, a ventilating-shaft (which would be all the better if it could be made large enough to serve as a manhole for inspection) should be made between the house and the sewer. This would generally serve as an inlet for fresh air, which, after passing through the house-drain, should find an outlet by passing up a soil-pipe, which should be carried up full bore to a few feet above the top of the house, but not contiguous to any window or chimney-opening, although, if the drains were properly constructed, there would be no smell perceptible at the top of the pipe. A current of air would, by the arrangement described, be continually passing through the house-drain and up the soil-pipe, or momentarily, perhaps, down the soil-pipe and so on out at the other end whenever a closet was flushed. Where one closet was placed above another, the sudden rush down the soil-pipe of the water from the upper closet past the end of the branch-pipe from the lower closet was apt to cause a partial vacuum in the lower branch-pipe, and so to partially unseal the trap of the lower closet, but that could be effectually guarded against by providing a short length of ventilating pipe for ventilating the branch-pipe between its junction with the down-pipe and the closet. All sink, lavatory, and bath wastes should be trapped, even where they discharged over a gully, for the interiors of the wastes were apt to become coated with offensive matter, and if they were not trapped they served as inlets for fresh air, which was apt to become contaminated in passing through them. With regard to the third principle, the lecturer strongly insisted on the necessity of having no direct communication between the cistern from which drinking-water was drawn and the water-closet. Not that two cisterns were necessary. All that need be done was to interpose between the main cistern and the closet one of the small waste-preventing flushing cisterns, fed from the main cistern by a ball-cock. The best of these small flushing cisterns were those which discharged themselves by syphon action, and the best of these, again, were those which had no valve to get out of order. In conclusion the lecturer described the way in which he had applied the principles laid down to the drainage of the Museum buildings.

A number of questions having been asked and answered,

Dr. Alfred Carpenter, who presided, moved a vote of thanks to Mr. Rogers Field for his interesting lecture, which was carried by acclamation, and, on the motion of Dr. Poore, seconded by Mr. R. B. Grantham, the thanks of the meeting were given to the chairman. The audience, which was unusually large, afterwards, under the guidance of the lecturer, inspected the drainage arrangements of the Museum.

THE LATE MR. C. H. STOCK.

A TELEGRAM from New Zealand announces the death of Cecil Haden Stock, A.R.I.B.A., of consumption, in his twenty-fifth year; and the sad news will, perhaps, have an interest for some of your readers, for architecture was a passion with him, and he made friends wherever he went.

A son of the Rector of Windermere, Canon Stock, and educated at Felstead School, in the summer of 1877 he became a pupil in his uncle's firm, Messrs. Snooke & Stock, and joined the Architectural Association, where he soon gained the first prize in the elementary class of design, and became its secretary. It was also under the Association's auspices that he went in 1880 to Venice, and returned thence with good store of sketches and pleasant reminiscences.

His office work after this was considerable, but he found time to become a student at the Royal Academy Architectural School, and studied diligently for the R.I.B.A. Examinations; and, in addition to this, he turned his attention to shoring and underpinning, and entirely on his own initiative wrote that successful treatise which Batsford published last summer, and which you were good enough to speak so highly of.

It was also last summer that he had the satisfaction of obtaining, in examination, the R.I.B.A. Associateship and the District Surveyor's Certificate, and was appointed surveyor to a building society in Westminster. He had also found time to submit a design for a church in competition. Strong and athletic as he seemed, however, this continuous strain of hard work must have been too much for him, for just after these successes, and almost without warning, he was stricken down by the disease which has killed him in less than a year.

It has removed one who promised to make a mark in his profession, and whose place in his own circle cannot be filled. H. W. S.

THE POINTING OF RUBBLE WALLS.*

MANY of the architects of the Victorian Gothic style have adopted the plan of pointing the joints of rubble walls; this appears to me a great mistake and a foolish waste of money. Such walls were never intended to be pointed, and never were pointed in the time of the Mediæval Gothic architects of the Henries and the Edwards; they were occasionally left visible, but rarely, and then only because there was not money enough at the moment to have them plastered and painted. Painting the interior of a church was always part of the original design, and the architect gave the design for the painting of the interior, just as he did the design for the mouldings, or other ornamental details. On the exterior these rubble walls were also plastered, but the surface was covered with rough-cast to keep out the wet. Many kinds of stone absorb so much moisture if they are exposed to the wet that the walls are nearly always damp, and this makes the interior of the church damp also. Pointing the joints between the rough stones of a rubble wall does not keep out the wet; it does no good either on the outside or inside. In the interior it almost prevents the wall being plastered over and a smooth surface made for painting upon, and the next generation will curse the ignorant people who have thus prevented them from having their churches painted. Perhaps you will be good enough to have this read at a Meeting of the Institute and printed in the Proceedings.

My experience may lead those architects who adopt this vile practice to discontinue it. I am aware that my good friend the late Sir Gilbert Scott is said to have set the example of doing this, but I am sure that he never intended to do so, nor did it in the way ignorant imitators do. It was always his practice in restoring cathedrals or any fine old church, to leave visible some parts of the old construction, in order to show what the real features of the building were before he began to restore it. In each of the nineteen cathedrals that were under his care as superintending architect at the time of his death, those who can understand such things can always find some portions of the original work left visible, but not conspicuous. His imitations were generally so well done that if he had not taken this precaution the next

* A letter addressed to the Secretary of the Royal Institute of British Architects.

generation would not have been able to distinguish the new work from the old; but he always considered it the duty of the architect employed to restore a fine old church, to make it a real restoration as far as possible, and not a new design with an old name. For this reason he always left visible a part of the old work, but not too conspicuous, lest it should have a bad appearance, for the general effect of the interior of the building is never to be lost sight of. JOHN HENRY PARKER, C.B.

FINE ART EXHIBITION AND TECHNICAL SCHOOLS AT HALIFAX.

ON Saturday last His Grace the Duke of Somerset, K.G., performed the double ceremony of opening the new Technical School and Mechanics' Institute and the Fine Art and Industrial Exhibition in connexion therewith, in the presence of a large gathering of people. The Huddersfield Mechanics' Institute dates back more than forty years, and during that period it has performed an exceedingly valuable work with regard to primary, secondary, and technical education; but it was some years ago felt that if Huddersfield and the neighbouring districts were to successfully compete with foreign nations in the production of articles of fancy manufacture it was necessary that still further opportunities should be afforded of acquiring that particular kind of technical instruction which should fit the workmen to carry on successfully the various trades in which they were engaged. It was at first decided to extend the old institution, but later councils of a joint committee of gentlemen from the Mechanics' Institute and the Chamber of Commerce determined on erecting a new building, at a cost of 20,000*l*. Plans were furnished by Mr. Edward Hughes, architect, and accepted, and a commodious building, fitted up with chemistry and dyeing rooms, weaving-shed, art-rooms, library, and all the necessary rooms, has been erected. About 15,800*l*. has been already promised or subscribed. Some months ago an exhibition was thought of as a means of drawing attention to the technical school, and committees were appointed for the purpose of carrying out the necessary details. The result is said to exceed the expectations of the most sanguine, and there is gathered in the various rooms of the new institute and the annexe and sheds adjoining a collection of articles little, if any, inferior to that which was to be seen at Bradford last year.

EXTENSIVE WORKS AT THE GENERAL POST OFFICE.

THE large new block of post-office buildings, on the west side of St. Martin's-le-Grand, which was erected only a few years ago, is at present undergoing an extensive enlargement by the addition of another story, and, in order to carry out the works, it has been found necessary temporarily to remove the balustrade which surmounts the elevation, and also the central pediment, resting on massive fluted columns, which encloses the royal arms. A portion of the work extending southwards, from the north end of the elevation to the pediment, is now almost completed, and in continuation of the enlargement preparations are now being made for the temporary removal of the pediment. The construction of the additional floor will carry the building to a further height of about 15 ft., and when the works in progress are finished, it will contain five floors and the basement, the general face of the elevation being 75 ft. above the street level, while the central portion with the pediment, as restored, will be 90 ft. in height. The enlargement is for the purpose of providing additional refreshment and other accommodation for the officials employed in the telegraphic department of the post-office service.

Further additions are likewise being made to those portions of the post-office buildings on the opposite side. In anticipation of the Parcels Post coming into operation, certain preparatory works have been in progress during the last few months, and are now almost completed. The area to be appropriated to the Parcels Post department is under the open space opposite Newgate-street, at the south corner of St. Martin's-le-Grand, extending eastward to Foster-lane, and the Parcels Post offices will be in a basement under this open space. The offices, from the Newgate-street frontage to Foster-lane, will be 160 ft. in length, and 36 ft. in width at Newgate-street, narrowing to about 25 ft. at Foster-lane. The offices have been formed by excavating the entire area from the ground level to a depth of about 25 ft. From the floor level to the ceiling the offices are 20 ft. in height, the ceiling or roof being formed by the ground area above enclosing the offices by a roadway flooring of concrete, resting on iron girders and arches. The offices will be lighted by opaque glass carried round the sides of this roadway. The entrance will be by a flight of steps near the Newgate-street approach, where a building containing a lift has been constructed for lowering and raising parcels to and from the office below.

Messrs. Mowlem & Co. are the contractors for both of the works above named.

REBUILDING THE "COCK" TAVERN.

THE rebuilding of this historical hostelry is intended to take the form of an extensive restaurant, with a handsome elevation to Fleet-street. The site has passed into the hands of those well-known restaurateurs, Messrs. Spiers & Pond, who have not only purchased the building lease of the old "Cock" proper from the parties to whom it was sold at the Auction Mart a few weeks ago, thereby entering into an undertaking to pay a ground-rent of 500*l*. a year for this portion of the site, and expend 5,000*l*. in rebuilding, but they have likewise taken from the Corporation, on an eighty years' building lease, the vacant land between the "Cock" and Mr. Attenborough's new building, now in course of construction, which contains an area of 2,100 superficial feet, and for which they are to pay a ground-rent of 800*l*. per annum, entering at the same time into an undertaking to expend a large sum in building upon the site. The intention of Messrs. Spiers & Pond is to perpetuate the old "Cock" by the erection of a restaurant on the entire site bearing the name of the ancient hostelry. Mr. Verity, architect, has been entrusted with the preparation of the plans.

CRICKET MATCH,

BETWEEN THE STUDENTS OF THE ROYAL ACADEMY OF ARTS, AND ST. JOHN'S WOOD ART SCHOOLS.

THIS match was played at the Eton and Middlesex ground, on Friday, June 29th, the Royal Academy Students winning by an innings and forty-six runs. For the Royal Academy, Blomfield, Swinstead, Kerr, and Simpson batted well, and the bowling of Keen was very effective. For St. John's Wood, Lovell played very steadily. During the afternoon the ground presented a very gay appearance, numerous artists of the fairer sex gracing it with their presence. After the match the rival elevens were most hospitably entertained by Mr. A. A. Calderon, at the St. John's Wood Art Schools.

ROYAL ACADEMY STUDENTS.

First Innings.

R. T. Blomfield, b Gunn	35	Ansell, b Lorraine	0
E. Smith, c Barry, b Gunn	1	F. Simpson, not out	25
H. Bates, b Dickson	3	W. Keen, b Lorraine	0
G. H. Swinstead, b Lorraine	39	Parker, b Maud	7
E. Woodthorpe, run out	7	C. Rea, b Lorraine	1
Kerr, b Lorraine	21	Wides, 3; byes, 4	7
		Total	146

ST. JOHN'S WOOD ART SCHOOLS.

First Innings.		Second Innings.	
Lovell, c Swinstead, b Keen	8	b Keen	11
Harris, b Keen	0	c Swinstead, b Ansell	1
Lorraine, c Smith, b Keen	0	b Keen	2
Tollemache, b Keen	3	b Keen	2
Gunn, b Keen	4	b Keen	4
Maud, c and b Keen	4	b Swinstead	2
Barry, b Keen	4	b Ansell	8
Dickson, b Swinstead	0	not out	0
Brown, not out	2	b Ansell	10
Egerton, b Swinstead	2	b Keen	0
Biddington, b Keen	1	b Ansell	4
Byes, 17; leg-byes, 2; wide, 1	20	Byes, 6; wides, 3	9
Total	47	Total	53

New Clock at Bisley Church, near Stroud.—A turret clock, the gift of Mr. J. Dorrington, has just been fixed in the tower of this church. Its manufacture was entrusted to Mr. J. W. Benson, of Ludgate-hill. The clock shows the time on two dials, 4 ft., and 4 ft. 6 in. diameter; it strikes the hours on a bell of 16 cwt., and chimes the Westminster quarters upon four others. The whole of the wheels are of hard brass, the escapement being a Graham's dead beat; the pendulum beats one second and a half, with a bob weighing 1½ cwt.

THE CITY OF LONDON COLLEGE.

ON Saturday last H.R.H. the Prince of Wales inaugurated the new building of the City of London College, situated in White-street, Moorfields, near Moorgate-street Railway Station. The institution, which was founded in 1848, migrated in 1860 from Crosby Hall, Bishopsgate-street to Sussex Hall, Leadenhall-street, and in both places its educational work was done by means of evening classes, always at great disadvantage for want of adequate space. The new building in White-street, erected at a cost of 16,000*l*., affords suitable accommodation for 4,000 students. It includes a spacious hall, a library, a reading-room, art and cast rooms, a laboratory, a coffee-room, and all the essentials of a college intended for the use of yonng students engaged in commercial pursuits in the City, the terms being such as to bring the advantages it offers fairly within their reach. The new building forms the corner of White-street and North-street, Moorfields, and has been erected with every regard to the comfort and convenience of the 4,000 and more students who annually attend the scores of classes which are held weekly throughout the greater part of the year. The accommodation provided includes class-rooms, laboratory, art and cast rooms, reading-room, council-room, library, and a handsome and spacious hall, in which weekly lectures and entertainments are held. The building has been erected by Mr. J. T. Chappell, from the plans and under the superintendence of Mr. Edward A. Crockett, architect.

WESTMINSTER JEWS' FREE SCHOOLS.

MOTIVES of economy have influenced the conception of this building (which was opened on the 4th inst.) from first to last. All ornamentation has been studiously eliminated, and the expenditure has been entirely devoted to affording accommodation suitable for the requirements of the institution. The architectural features cannot be described as belonging to any particular epoch, but the effect is pleasing and the architecture clearly demonstrates the object for which the building has been erected.

The front elevation to Hanway-place and John-street is built of stock-bricks with terra-cotta and red Fareham brick dressings; an ornamental band runs above the arcading which forms the playground hereafter to be referred to, on which is an inscription, "The Westminster Jews' Free Schools, founded 1811, rebuilt 1882." The boys' entrance is in Hanway-place and the girls' entrance is in John-street.

The general disposition of the plan has been actuated by the peculiar configuration of the site and its surroundings. Hanway-place and John-street being rather narrow thoroughfares, advantage was taken of a disadvantage to place the school-rooms at such a height that the buildings on the opposite side would not interfere with the light and air; moreover, the circumscribed space at command rendered it necessary to appropriate as much of the land as possible for playground purposes; accordingly the whole of the ground-floor has been arranged so as to throw the same into playgrounds.

Two large covered playgrounds, one for girls and the other for boys, have been placed under the main building, each covering an area of about 1,200 ft., open upon all sides, and yet protected from the inclemency of weather. These are fenced in from the streets where they adjoin the same by strong ornamental railings, the level of the playground floor being kept considerably below the level of the pavement so that the children may not be interfered with by persons from without. The other portion of the ground-floor has been equally divided as open playgrounds between the boys and the girls; these playgrounds will be fitted with gymnasiums the gift of Mr. Edward Wagg.

The boys enter the building under the covered playground in Hanway-place, where is conveniently situated their cloak-room, which is heated by hot water, so that in the winter weather the clothes may be dried whilst deposited there. It is fitted with umbrella-stands, seat so that damp boots may be removed, and with all necessary hooks and rails for hanging clothes on. Adjoining this room is a luncheon-room, with fireplace, and solid wood flooring; next to this luncheon-room is the lavatory, fitted with Shanks's tip-up basins and galvanised iron framing. Water-closets and urinals of good description have been provided, and are

attached to each playground. The apparatuses have been supplied by Messrs. Bowes, Scott, & Read, and are so devised that they automatically flush themselves at stated periods, and will thus be kept in a clean and wholesome condition.

The whole of the playgrounds have been paved with asphalte, and drinking-fountains for the supply of filtered water have been provided for the use of each sex.

The girls' side is precisely similar to that of the boys, and contains similar accommodation.

On the first floor is situated the girls' school-rooms, which are arranged so as to afford a maximum of light, air, and ventilation. The front range is 80 ft. long by 22 ft. wide, and by a height of 16 ft., and is divided into three class-rooms fitted with platforms and dual desks designed upon the most sanitary principles, which have been supplied by the North of England School Furnishing Company.

The centre schoolroom will afford accommodation for 60 children, and the two side ones for 50 each. Attached to this front range are two class-rooms, 16 ft. by 23 ft., and 20 ft. by 16 ft., one of them having in addition a gallery, which will be used for infants' classes. The head mistress's retiring-room adjoins, and is so situated as to command supervision of the playground.

The interior walls have the brickwork painted, the woodwork stained and varnished, and the ceilings plastered.

The front range is so planned that it forms one apartment at pleasure, to be used upon the occasion of a general examination, or for any public requirement, the partitioning forming the rooms sliding back. These apartments are fitted with school cupboards and every convenience.

All these rooms are primarily heated by Boyd's stoves, which have hot or cold air-chambers formed round them, so as to admit pure air from the exterior, and are calculated to warm the cubical contents which the several rooms contain. In addition, each room has been fitted with a Weeks's hydro-caloric coil, these admitting in an upward current pure warm or cold air, so that each apartment will have its full complement of pure filtered air continually discharged into the same. The impure air will be drawn out through ventilating flues specially contrived in the thickness of the walls; ascensional power has been obtained first by the use of Boyd's plates, which are of iron, and form one side of the chimney flue; secondly, by Bunsen gas-burners, which, being continually burning therein, will be always drawing off the vitiated atmosphere, and it is hoped and believed that this simple method of ventilation will prove itself thoroughly efficacious. In addition to this ventilation, there is the usual arrangement of windows upon all sides, so that, after the schools are emptied, by opening the same a thorough current of air will be admitted, and thus all impurities can be at once swept away.

Great care has been exercised that each room shall be distinct in itself, instead of being, as is often the case, passages leading from one room to another; a corridor, therefore, is situated in the rear of all these rooms, heated by warm water, so as to prevent the children catching cold by coming from one atmosphere into another, and insuring the privacy of each of the educational departments.

Between the heights of the floors has been obtained,—on the one side, the carekeeper's apartments, consisting of kitchen, living-room, bedroom, larder, and all other necessary contrivances; and, on the other, the committee-room, with additional cloak-rooms for the children,—all heated and ventilated as before described.

The second floor is appropriated to the boys' school, and contains precisely the same accommodation as that afforded to the girls, including masters' rooms, water-closets, lavatory, and other accommodation.

A noticeable feature in the building is the construction of the staircases: the steps are formed of Lascelles's concrete, which are covered with Hawksley's wooden treads; they are in very short flights, and have been so arranged that, in the event of panic or otherwise, it is almost impossible for accident to arise, whilst, should the treads or landings wear out in course of time, they can easily be replaced at a trifling cost and without disturbing the general arrangements of the building. The walls here have been faced, through the kind liberality of the treasurer, Mr. Julian Joseph, with dados of glazed bricks; this will ensure cleanliness and will prevent the disagreeable appearance which staircases attached to buildings of this character so generally present. It need scarcely be added that both staircases and corridors are absolutely fireproof.

Great care has been exercised with regard to the plumbing and drainage arrangements; all the pipes, whether plumbing, gas, or otherwise, are exposed, and are easy of access; so, likewise, are the cisterns, and, where used for potable purposes, all water passes through filters which have been supplied by the London and General Water Purifying Company.

The drainage is cut off from any connexion with the main sewer; all waste pipes and rain-water pipes have also been carefully disconnected and are easily accessible. The whole of the drain-pipes are carried in trenches exterior to the building, and are so arranged as to admit of being easily cleaned out or repaired without disturbing any portion of the structure; the architect's great experience upon these subjects having been fully utilised in order to secure as perfect an arrangement as possible.

The building will, practically, accommodate 500 children; the cost, with fittings, &c., will be about 6,500*l*., or 13*l*. per head, which contrasts very favourably indeed with the cost of buildings of this description.

The land was obtained by, and the buildings erected from the designs of, Mr. H. H. Collins, architect, 61, Old Broad-street, and they have been well executed by Messrs. Sabey & Sons, of 96, Ironmonger-row, St. Luke's.

FOREIGN NOTES.

The new Concert-house at Leipsig.—The new concert-house, or, as it is officially termed, the New Gewandhaus, at Leipsig, which is being built by Baurath Schmieden, of Berlin, according to the project furnished by that architect in conjunction with the late Professor Gropius, is already so far advanced towards completion that the work of finishing and decorating the interior is about to be taken in hand. During the past month a collection of sketches for the interior and exterior decoration has been exhibited at the Museum at Leipsig, and has excited great interest among architectural circles in Germany. In addition to the sketches, there is a beautifully-executed coloured model of the Grand Concert Hall, which effectually exhibits the style of the apartment in which the renowned Gewandhaus performances are to be continued in the future. The greatest possible attention has been paid to the question of ventilation, and everything has been done in order to secure the best acoustic effects. For example, all the walls, the floor, and the ceiling of the concert-hall are constructed double. They are made of fireproof material, faced with wood. The figures for the decoration of the façade are to be carried out under the direction of Professor Schilling, of Dresden.

The New Palace of Justice in Rome.—The competition for the new Palace of Justice in the Italian capital is limited to architects who are Italian subjects. The designs are to be sent in by June 30th, 1884. There are three prizes, of the respective values of 15,000 lire, 9,000 lire, and 6,000 lire, or 600*l*., 360*l*., and 240*l*. each. The jury will consist of a Commission under the presidency of the Minister of Justice, one third of the members being architects and engineers in the employ of the State. The award is to be by a two-thirds majority of the Commission. The Government does not bind itself to carry out any of the successful projects, and, moreover, reserves to itself the selection of the chief architect. According to the programme, the chief apartments in the New Palace are to be as follow:—The Court of Cassation with apartments for counsel; the Court of Appeal; the Court of Assizes; the Civil Tribunal; the Criminal Tribunal, with apartments for the king's counsel; the Tribunal of Commerce; the Chamber of Advocates; the Court of Discipline; and the Registrature, besides various subordinate offices. The programme prescribes in detail the number and dimensions of the various apartments. The site is in the Prati di Castello, and the cost of building the entire palace is not to exceed the sum of eight million lire, or 320,000*l*. sterling. This sum, however, does not include the decorations, with statues, reliefs, paintings, &c. The drawings are mostly to be on the scale of one to a hundred; but the most important details are said to be on the scale of one in ten, and the architects are to include sketches representing the proposed method of ventilation and warming, as well as estimates of the total cost.

Electric Wire Rope Railway.—Amongst the curiosities which will be exhibited at the approaching International Electrical Exhibition at Vienna will be a short wire-rope railway in which the motive power is electricity. This novelty will not be a mere toy model for the amusement of visitors, but will be employed to convey coals from the railway on the banks of the Danube to the Rotunda, in which the exhibition is to be held in the Prater. The line will also be peculiar from the fact that it will run above the roofs of the sheds surrounding the Rotunda, and terminate in a court, or open space, where a boiler-house has been erected.

The Palazzo Barberini in Rome.—It is reported that the splendid Palazzo Barberini, situated in the Via delle Quattro Fontane at Rome, has been recently purchased by Prince Torlonia, who, however, cannot take possession of the Palace until after the death of the hitherto owner, Prince Barberini. The edifice, which was begun by the architect Maderna, and finished by Bernini, is one of the most extensive in the Italian capital, and in the year 1870 was selected as the temporary residence of the Italian Royal Family.

FIRE INSURANCE IN BERLIN.

FROM the official report recently published by the municipal authorities of Berlin, it appears that on the 1st October last there were 18,543 houses or tenements insured against fire within the boundaries of the city. The total amount for which they were insured was 2,072,151,500 marks, or 103,607,575*l*. sterling. The report contains statistics respecting the operations of the Fire Brigade and the losses occasioned by fire during the past twenty-two years. In the business year, from October, 1860, to October, 1861, the number of fires, or alarms of fire, which had called out the Brigade was 127. In the business year, 1881-82, the number had risen to 571. The number of fires from which any actual loss arose was, at the former date, 100, and at the latter date, 506. The alarms of fire and the destructive fires had, therefore, both increased about 400 per cent. in the twenty-two years' interval. Within the period in question, however, the number of houses has not increased 100 per cent. It follows, therefore, that the number of destructive fires has increased in the interval at far greater rapidity than the houses, being, in fact, nearly three times as numerous now as compared with 1860. This large increase, which has been made, not suddenly, but with a regular and steady rise throughout the period in question, is attributed partly to the less solid style of building, but chiefly to the substitution in recent years of gas and petroleum for candles and the older oil-lamps in the illumination of shops, factories, and dwelling-houses.

PRACTICAL EDUCATION.

THOSE students in the Crystal Palace Company's School of Practical Engineering, who are working for the marine branch of the profession have just returned from their sea trip, which has been made the occasion of an inspection of some important engineering works. These periodical excursions are intended to afford them real practice in the driving of marine engines at sea, and are a marked feature in the system of the school. Usually the run has been made from the Thames to Liverpool and back, but this year, with the intention of going over the works of the new Tay Bridge, the voyage has been made to and from Dundee, a distance of 1,000 miles. On Wednesday, June 27th, at 9 a.m., the students, under the direction of Mr. J. W. Wilson, C.E., the principal, and one superintendent, embarked at the New Dundee Wharf, Wapping, on the ss. *Cambria* (950), and the Dundee, Perth, and London Steamboat Company offered every facility for the work of the voyage. Before starting, the speed of the *Cambria* was tested at the measured mile and proved to be 14·25 knots. The dead reckoning was then taken, and was to time at all points both out and home. For purposes of work the students were divided into four watches of four hours each, during which time those on duty had to be in the engine-room taking their part in the driving, under the ship's engineer, Mr. Scott,

in their usual working clothes. The water was smooth, and Dundee was reached at 5·40 p.m. on Thursday evening. On Friday morning, the students rose at six, and an hour later proceeded up the river Tay in the Perth steamboat. By the kind invitation of Messrs. Shield they there inspected the Wallace Linen-Weaving Works, where 1,000 hands are employed, and saw much that interested them. Saturday was employed in looking over the old Tay Bridge, and the works of the new structure which is being raised by Mr. W. H. Barlow, C.E., who was kindly anxious that the party should see all they could. Mr. Byng, an old pupil of the Crystal Palace School, is one of the superintendents of the new bridge. After inspecting the *Dundee*, a very fast boat now being finished for the Dundee, Perth, and London Company, the students embarked again on the *Cambria* at nine on Saturday evening for the return cruise, and arrived at the wharf in the Thames at 7·30 a.m. on Monday. The cruise was a most enjoyable one, and is thought the most successful ever made by the students of the school.

THE NEW RAILWAY STATION AND BRIDGE ACROSS THE THAMES AT BLACKFRIARS.

RAPID progress is being made with the new City station and the bridge across the Thames at Blackfriars which are in course of construction for the London, Chatham, and Dover Railway Company. It is only about six months since Messrs. Lucas & Aird, the contractors, entered upon the undertaking, and already a considerable amount of preliminary work has been accomplished. Upwards of 300 artisans and labourers are at present employed at the works, and no fewer than nine steam engines at the shore and river points where operations are going forward, facilitate the progress of the undertaking. On the Middlesex side at Thames-street and Queen Victoria-street, where the new station is to be built, and the northern abutment of the bridge are to be erected, the necessary excavations have been almost completed, and the foundation walls are being got in. The work of driving the necessary piles in the river, preliminary to the construction of the four sets of piers to carry the bridge, has likewise been effected, and as regards the two central piers the iron coffer-dams are so far advanced that the water is to a certain extent kept out. Divers are employed in examining the bed of the river at these points with the view of the necessary excavations for the erection of the stone piers being proceeded with, and it is expected that within two or three months the piers at these points will have been built. The preparations for the shore abutments of the bridge on the Surrey side of the river at Blackfriars are also in an advanced state.

THE ENGINEERING AND METAL TRADES' EXHIBITION.

THIS exhibition, opened in the Agricultural Hall on the 5th inst., is of wider and more general interest than its predecessor, the Naval and Submarine Engineering Exhibition, which was held in the same building in April of last year, and was noticed by us at the time. The present exhibition is, too, a larger one than that of last year, and some idea of its extent and importance may be faintly gathered from the statement that the aggregate value of the exhibits here brought together,—to be on view only until the 21st. inst.,—is estimated at 400,000*l*. There is, it goes without saying, plenty for the general visitor to see and to marvel at, and much to instruct the technical observer, but both classes of visitors would be benefited if exhibitors would refrain from covering up their stands an hour before the exhibition closes, and if the managers of the exhibition would, failing the electric light, turn on a little more gas. Of machinery in motion there is a good display, and various new forms of boiler are used to provide the motive power.

Among the most striking of the exhibits are those shown by the eminent,—may we not say pre-eminent?—firm of Sir Joseph Whitworth & Co., who have a large Stand (No. 204) near the centre of the hall, for the display of some Titanic productions in the Whitworth fluid-pressed steel. The steel of which these objects are made is submitted to great pressure whilst in a fluid state, and the ingots thus obtained are afterwards forged to the required shape by hydraulic pressure. One of the articles thus produced is a hollow propeller-shaft for a screw steamship. This shaft is 55 ft. in length, 18¼ in. external diameter, 10 in. interior diameter; collar at one end 34 in. diameter, and weighs 15½ tons. It is claimed for this shaft that it is at once 28 per cent. lighter and 30 per cent. stronger than it would be if made of solid wrought iron. Another gigantic specimen of forging in the same metal is a double-throw crank shaft for a paddle steamer. This shaft has a length of 26 ft.; a diameter of 18 in.; throw of cranks, 24 in.; and weighs 12 tons 12 cwt. A beautiful specimen of workmanship is the large cylinder-lining, with internal flange, for a marine steam-engine. It has been made from a hoop of fluid-pressed steel, and enlarged to size by forging. Its diameter outside is 81 in.; length, 59 in.; diameter inside 77 in.; thickness, 1¾ in.; and weight, 65 cwt. There are many other objects at this stand which serve to illustrate some of the greatest achievements of modern metallurgy and mechanical engineering, but we must pass on, not omitting to refer to the huge boilers which stand not far off, one of them being temporarily fitted up internally as a miniature boudoir, and illuminated by incandescent electric lamps in connexion with a storage battery. The catalogue, which is well printed and appears to be carefully compiled, gives a classified list of the different kinds of exhibits, and, as this list occupies some seventeen pages, some idea may be gathered of the comprehensiveness of the collection. In all there are about 450 exhibitors, many of them firms of world-wide repute. The exhibits are classified under twelve sections, viz.:—I. Mining and Metallurgy; II. and III., Casting, Forging, and Rolling; IV., Hydraulics, Pneumatics, &c.; V., Workshop Tools and Appliances; VI., Rail and Tramway Work; VII., Bridge, Roof, and Girder-work, Docks, &c.; VIII., Electric and Telegraph Work; IX., Sanitary Engineering; X., Machinery for the Treatment of Raw Produce: XI., Marine Engineering; XII., Military Engineering. Many of the exhibits in some of these sections are, of course, necessarily shown in the shape of models and drawings, of which there is an interesting loan collection on view in the gallery, some well-known civil engineers being contributors. An interesting part of the display in the gallery is that composed of working-men's exhibits, chiefly in the form of models of inventions or specimens of workmanship; there are thirty-three contributors to this part of the exhibition. Any attempt to refer in detail to the multiplicity of objects exhibited would be futile; we may, however, refer to a few exhibits likely to specially interest our readers. In the Arcade leading from Islington-green, at Stand 2, Madame Vve Delong, of Paris, has an interesting display of metal fretwork for stained-glass window-frames, door-panels, &c. At Stand 19, in the main hall, Mr. Edward Clements (Jeakes & Co.) shows a very complete collection of laundry machinery in motion. Messrs. Thomas Robinson & Son (Limited), of Rochdale, exhibit some very good wood-working machinery in motion. Messrs. Samuel Owens & Co., of Whitefriars (Stand 36), have a good display, including pumps, Lacour's direct-acting steam pile-driver, well-sinking tools, hydraulic rams, and the "Cassiobury" fire-extinguisher. At Stand 57 Messrs. Greenwood & Batley, of Leeds, show Tracey & Shedlock's hand-power rock-drill in action. It should prove useful to the contractor and the mason. Mr. E. S. Hindley (Stand 58) exhibits steam engines and boilers, and a circular saw-bench with band-sawing apparatus and special arrangements for boring, tenoning, and spoke hunting. At Stand 60, Messrs. W. & T. Avery, of Birmingham, are exhibitors of a 10-ton self-contained wagon weighbridge, fitted with Chameroy's patent self-recording steelyard, by means of which a strip of card is impressed with a record of the exact weight of the load. In view of the approaching operation of the Parcels Post, Messrs. Avery, who are contractors to the General Post Office, show some handy scales which they have made for use in post-offices and in business establishments. Messrs. F. W. Reynolds & Co., Southwark, are exhibitors, at Stand 62, of some of their well-known specialities in wood-working machinery. At Stand 131 Messrs. Robert Boyle & Sons display their ventilators and air-warming apparatus. At Stand 133 the Bower-Barff Rustless Iron Company are exhibitors of specimens of ironwork treated by their process. At Stand 139, Messrs. W. F. Dennis & Co., representing Messrs. Felten & Guillaume, of Mulheim, near Cologne, are exhibitors of iron and steel wire of all kinds for fencing and telegraph purposes. A cast-steel wire for telephonic purposes is submitted by them as worthy of notice, on account of its high breaking strain. At Stand 197, the Aluminium Crown Metal Company show an assortment of goods, such as hinges, door-handles, &c., made of their alloy, known as Webster's Aluminium Metal, which, it is claimed, combines with great tensile strength and resistance to compression a non-liability to tarnish. At Stand 203 Messrs. Salmon, Barnes, & Co., of Ulverston, show their curvilinear iron shutters, and the "Roanhead" patent rock-drill. The Pennycook Glazing and Engineering Company (Stand 212) show the application of their patent method of glazing without putty. Messrs. R. F. Dale & Co., of Southwark (Stand 234) are exhibitors of gun-metal castings, steam valves, fire hydrants, &c. At Stand 241, Mr. T. W. Helliwell, of Brighouse, Leeds, shows his system of glass roofing without the use of putty, and his method of fixing zinc and iron roofing without bolt or rivet holes. Messrs. Archibald Smith & Stevens (Stand 257) show their hydraulic balance passenger lifts and other lifts and hoists. At Stand 335 Mr. John Bell, of Southwark, exhibits that exceedingly useful and valuable material, asbestos, in a variety of applications. At Stand 344 Messrs. F. Braby & Co., Limited, are exhibitors of filters and tanks. At Stand 372 Messrs. Hayward Bros. & Eckstein exhibit their semi-prism ships' deck and street pavement lights. In the centre of the hall space is reserved for "Models of the Channel Tunnel," but up to the time of our visit these were not in place.

The Exhibition closes on the 21st inst.

A PUBLIC WINTER GARDEN AND A THEATRE AT EASTBOURNE.

AMONGST the many public buildings which are in succession rising up in this favourite and rapidly-increasing seaside resort, a public winter garden, and also a theatre, will shortly be added to the number. The winter garden is to be immediately erected on a spacious site, having its frontage to Terminus-road, the leading business thoroughfare in the town. The site belongs to Messrs. Hart, and at present forms one of the largest and finest private gardens in Eastbourne. Some time ago the local authorities were anxious to secure it as the site of the new town-hall, and they made an offer to Miss Hart for its purchase, but she declined to dispose of it for that purpose, and the authorities have been compelled to fall back upon a site by no means so central. It has now been leased by the owner to Mr. Willard, an enterprising local tradesman, who is about to erect public winter gardens on the site. The gardens, which have been designed by Mr. C. Hollebon, will be constructed of glass, wood, and iron, forming a kind of local Crystal Palace. They will have a frontage to Terminus-road of 150 ft. in length, and internally will contain a walk or promenade nearly half a mile in length, under a glass roof. There will be a large show-house in front, approached from Terminus-road, with conservatories falling back at each side. The building throughout will be heated by water-pipes two miles in length.

The town will also have the advantage of possessing a theatre in the course of a month. The building, which has been in course of erection for some time past, is now rapidly approaching completion, and is intended to be opened the first week in August, when the popular comedian, Mr. J. L. Toole, will appear. Mr. Fell is the contractor for the building.

The Duke of Argyll on House Sanitation.—The London Sanitary Protection Association are to hold a meeting in the Kensington Vestry Town-hall on Tuesday, the 17th inst., at 8·30 p.m., and the newly-elected president (the Duke of Argyll) will take the chair for the first time, and will deliver an address upon this subject. Tickets can be obtained, gratis, on application to the secretary of the Association, at its office, 1, Adam-street, Adelphi.

PROVINCIAL NEWS.

York.—The new premises in Davygate are now completed, and consist of shops and offices. They have been built for Mr. Alderman Melrose by Mr. Biscombe, of York, from the designs of Messrs. Perkin & Bulmer, architects, of Leeds.

Whitby.—The new building in Baxtergate is now occupied by the National Provincial Bank of England, Limited. There is also a new shop adjoining, with offices on the upper floors and apartments for bank residence. The builder was Mr. John White, of Whitby. The carving was executed from drawings of the architects, Messrs. Perkin & Bulmer, by Messrs. Mawer & Paylet, of Leeds.——Business premises in Silver-street, for Mr. Charles Fisher, plumber, from the plans of Messrs. Perkin & Bulmer, are now completed and occupied.——A residence, with stabling, for Mr. Willliam Wright, is now being built in Upgang-road, from the designs of Messrs. Perkin & Bulmer. Four houses and two cottages in Stakesby Vale, for the same gentleman, have recently been erected.

Newcastle-on-Tyne.—A new drill-hall for the Third Volunteer Battalion Northumberland Fusiliers has been erected. The site, which was obtained from the Corporation, is situate in Bath-road, in the rear of St. Thomas's Church. The building was erected according to plans prepared by Mr. Newcombe, architect, Newcastle, and it is one of ample dimensions, and comprises all the accommodation which a volunteer regiment requires. The front is composed of red brick faced with white stone. On the ground-floor is the armoury, adjutant's office, permanent staff office, store-rooms for clothing, lift, and large room for non-commissioned officers and privates. The first floor contains officers' mess-room, lavatories, &c., officers' mess-kitchen and store-rooms. Shut off by a door midway in the passage are the Sergeant-Major's quarters, comprising on that floor two rooms. On the second floor the sleeping apartments of the Sergeant-Major and family are situated, and besides that there is a large store-room. Beside these buildings is the spacious drill-hall, enclosed with brick walls and an iron roof, and covering an area of 200 ft. by 85 ft. The hall is completely lighted up with gas. It is to be called St. George's Hall.

Crewe.—The trade of Holyhead is likely to receive a considerable impetus owing to the completion of the extensive market and abattoirs at Crewe by the London and North-Western Railway Company for the English, Irish, and foreign cattle trade. These were opened a few days since. In anticipation of considerable trade from Ireland, Canada, and Scotland, the company have provided extensive siding accommodation at Crewe, while at Holyhead the harbour will be enlarged, and very probably the works at Salt Island, to which we have on several occasions referred, will be carried out. The Platters Rocks in the Holyhead new harbour have just been re-surveyed, and it is stated that the engineer's report is much more favourable than on previous occasions, and that this obstruction can be effectually blown up. No doubt the increased trade which will centre in Holyhead in consequence of the new arrangements will tend greatly to the benefit of the town, and, as we have already pointed out, Holyhead, owing to its commanding position and the march of events, is evidently destined to become a place of great importance in North Wales, and a district of large population and much commercial prosperity.

SCOTCH NEWS.

Suggested Museum of Hygiene for Edinburgh.—It is again proposed to establish a Museum of Hygiene for Edinburgh. It is suggested that the Edinburgh Health Society and the Combe Trustees should co-operate in the matter. A proposal for the establishment of such a museum was made about three years ago by Mr. H. Aubrey Husband, who proposed to associate the name of George Combe with the Institution. Although Mr. Husband received offers of assistance from many quarters, the project was allowed to fall through, owing to the difficulty of finding suitable premises for the exhibition of the appliances which were offered.

The New Extension of the "Dundee Advertiser" Office, which has lately been completed, has a frontage to Bank-street of 61 ft., and consists of a sunk flat and five flats above the street level. The total height of the front to Bank-street is 60 ft. from the street, and from the basement-floor to the ridge of the roof is 77 ft. The front has been designed to harmonise with the older part of the building, and at the same time to group with the adjoining properties, so as to form a symmetrical elevation to the north side of Bank-street, along which the completed frontage of the office now measures 215 ft. The whole is of polished ashlar, of a beautiful blue colour, from the Leoch and Fallaws Quarries. The foundations of the front consist of solid ashlar blocks in piers, set on inverted arches, and all built in cement. Great care had to be taken in under-pinning the gable at the west end of the old part of the office, it being founded at the street-level, while the new building is founded 12 ft. below the street; but, by strong shoring and wedges, this was successfully accomplished. One interesting point in connexion with the internal economy of the building is that a hydraulic lift, worked from the pressure of water in the town water-mains, and capable of raising half a ton weight at a speed of 40 ft. per minute, has been erected for raising the rolls of paper to the paper-stores. This lift rises from the basement to the highest floor, a height of 64 ft. The building is heated by small-bore malleable iron pipes, by Mr. Charles Ritchie, of Edinburgh. Ventilation-tubes, about 6 ft. high, are placed in the corners of the rooms, and in each tube there is a coil of pipe which heats the cold air coming into the tube from the outside before it enters the room, thus preventing cold down-draughts. Outlet ventilators, with mica flaps, are placed in the walls near the ceilings. Messrs. C. & L. Ower are the architects, and the contractors for the various branches were the following:—Mason's work, Mr. Gentle; joiner's work, Mr. J. W. Lyon; slater's work, Mr. Martin; plumber's work, Mr. Farquharson; plaster and concrete work, Mr. M'Ritchie; iron roof and floors, Messrs. Lee, Croll, & Co.; fireproof doors, Mr. D. Keay; iron beams, Messrs. Measures Bros., London, and M'Lellan, Glasgow; hydraulic lift, Messrs. Whyte & Cooper; glaziers' work, Messrs. Lindsay & Scott; wirework, Mr. Dickie; painter's work, Mr. Norwell; heating, Mr. C. Ritchie, Edinburgh; iron stairs, Lion Foundry Company, Kirkintilloch; stone-carving, Mr. Neilson, Edinburgh; street-gratings, Messrs. M'Culloch, Glasgow. Mr. David Gemmel acted as clerk of works.

THE EXTRA SCALE OF PAYMENT FOR OVERTIME.

SIR,—A considerable amount of uncertainty, dissatisfaction, and consequent agitation, hinges on to this question of overtime payment. The whole difficulty of the matter lies in the fact that the associated builders and employers have not held to or abided by the old body of rules as formulated by themselves. These rules expressly state that where the standard rate of wages is 9d. per hour, overtime is to be paid for at the following rate:—The first extra hour at 10d.; from the end of the first extra hour until eight p.m. at the rate of 11d. per hour. Time worked after eight till ten at 1s. 1½d. per hour; after ten double until six a.m. Overtime on Saturday to commence at twelve o'clock noon at the rate of 1s. 1½d. per hour until five p.m.; after five p.m. double time until half-past six on the Monday morning; and systematic overtime to be discountenanced in the interests of unemployed men.

Some employers, for cogent reasons connected with certain office routine of special pricing, evade the letter of these rules, but not the substance, by allowing an equivalent sum in time at 9d. the hour. Some of the employers' customers would object to paying what they conceive to be a "fancy" scale of wages, while offering, in the majority of instances, no particular objection against paying for any given number of hours on the usual scale,—a delightful and refreshing instance of obtuse differentiation between our old friends Tweedledee and Tweedledum.

The United Trades Council have recently had this matter brought before their notice, and have informally determined to stand by the old rules so long as those rules are not superseded by any joint action of the masters on the one hand, and the men on the other.

FRANK MOORE.

SCHOOL BOARD CONTRACTS.

SIR,—With your permission I should like to notice and make a few remarks upon one passage in the letter of your correspondent of last week, p. 31, leaving it to others to answer for what may be only apparent inconsistencies or extravagance in the architectural administration.

"There is provision for a lump sum; this sum the builder puts in his contract; the architect deducts it from the builder and pays the sub-contractor by cheque direct from the Board." This is the most sensible and the most gratifying news I have read for many a day. I will at once try to get a School Board sub-contract. For a sub-contractor to be *sure* of prompt payment will very much lessen his anxiety and enable him to reduce the amount of his contract by the 2½, 5, or 10 per cent. which the builder exacts for the privilege of paying over the money already received on his behalf.

In most cases the architect will explain, when asking say, the "domestic engineer," for drawings and estimates, that though payments will be made through the builder upon his certificate, no deduction or allowance will be expected: consequently the estimate (in competition submitted) will have been prepared leaving but small margin for profit. But I think every one who has been favoured with a sub-contract of this description knows that,—without impugning the honesty of the builder,—unless a percentage is allowed they will hang fire, and so put the sub-contractor to sometimes trouble and inconvenience before making a settlement, although they have long since received their money.

Doubtless the School Board have had some experience, and probably annoyance too, of this kind, before they were induced to establish so wise a precedent.

ROBT. CRANE.

FIREPROOF FLOORS.

SIR,—As a subscriber I should be glad if any reader could give a description of the best method of forming fireproof floors between residential chambers, having due regard to the prevention of sound and to the conditions of the Metropolitan Building Act. Hitherto I have formed the same with rolled iron joists about 2 ft. to 3 ft. apart, filled in with concrete, the underside being plastered for ceiling, the 4½ in. by 2 in. joists being laid the reverse way on the iron joists, and covered with battens. This method does not prevent sound, however, as well as one would wish, and I fear cannot be considered fireproof.

C. W. H.

PROTECTION FROM FIRE.

SIR,—Can you inform me whether the water tower on the American system has been introduced in this country for the protection of tall buildings? I believe it is an excellent, and, at the same time, a simple arrangement.

M.

FLUES.

SIR,—In reference to the question of the size of smoke-flues, I would beg your permission to add my testimony to the value of small flues, as against large ones, in dwelling-houses. I designed a house in the country for a gentleman, who contrived beforehand to render me nervously apprehensive, by many and strict injunctions against any smoky chimneys in his new house. I promised nothing but to do my best, knowing only too well how uncertain a factor is the progression of smoke. After some consideration I decided to use 9-in. by 9-in. flues, starting them immediately off flag fireplace-covers. The result was that from the first time when the house was entered upon for habitable purposes not a breath of smoke was reported. The flues draw well, and have never been complained of.

I should not, probably, have had the temerity to risk so much on a point which was crucial, had I not remembered to have read that all the flues of the Westminster Palace Hotel are 9 in. by 9 in., excepting the kitchen flue, which is only 14 in. by 9 in. This fact was stated in your pages many years ago in a report of a paper read at the Institute by the architects of that building, where it may doubtless still be found. If I remember rightly, a special dispensation had been obtained for the purpose. I protest against such dispensations, but much more against the necessity for them.

It is said that there is a law (not a Building Act by-law) that all flues are to be 14 in. by 9 in., but I am not ashamed to own that I do not know it for certain, and that I have evaded it with success in the manner above described. Sir, is it not a shame that such a law should stand on the books of a free country?—a law at once tyrannous and mischievous? I am told that a person exists whose duty it is to inspect the construction of flues; that this official has been known to obtain convictions, the fines from which go into his own pocket; that after obtaining such convictions he goes away and leaves builders of all classes to do as they like. Manifestly this is either too much interference or too little,—too much for benefit, and too little for the prevention of evil. The mode of payment adopted is just the very worst that could be devised, as it prevents the official from staying to clinch his victories, but drives him to seek "fresh fields and pastures new," whilst the former delinquents are safe from any further visitation for some time.

I risked this gentleman's anger as well, and made all my flues, kitchen flue and all, 9 in. by 9 in., and, strengthened in my conclusions by your previous valuable correspondence, I cannot but think that those dimensions are sufficient. But I am not comfortable about using them if there be a law such as I have named, and such an official.

A YORKSHIRE ARCHITECT.

*** There is now no such law in the metropolitan districts.

OLD MEETING TRUST, BIRMINGHAM, CHURCH, &c., COMPETITION.

SIR,—The design for the above which you illustrate in last week's *Builder*, by Messrs. Henman & Beddoe, was admitted to be the best sent in, and meets the "instructions" sent out by the trustees, and the requirements of the case in nearly every particular.

The designs placed first and second (the first especially) fail to comply even with the "instructions," much less with the requirements, and I, as well as the others (including the trustees), am surprised at the attempt at criticism by a professional referee, and at the result of the competition.

The trustees obtained (after inviting two eminent London architects who were unable to come) the services of a well-known provincial architect,—in fact, one of the Council of the R.I.B.A.,—to inspect and report on the merits of the designs submitted in competition, but from what I have heard, the report sent in to the trustees is not from notes made by the gentleman appointed as assessor, and through the medium of your valuable journal I should like to know, for the benefit of the trustees, whether:—

1st.—Did the gentleman appointed by the trustees inspect the designs personally, or not?

2nd.—If he did not personally inspect them, was the person who acted on his behalf a competent person?

To uphold his own reputation, and the dignity and honour of the profession, the assessor should reply in answer to these questions. A silence will be taken as admitting having entrusted onerous and responsible duties to a person who has given a biassed decision.

ONE OF THE LAST FOUR.

*** We should not admit this communication, but that we continue to receive others to the same effect.

BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

3,225. E. Raitt, London. Water-waste preventers. June 29, 1883.

3,247. J. Carrick, Glasgow. Cooking-ranges and ovens. June 30, 1883.

3,262. J. W. Thornton and F. Milan, Huddersfield. Method of opening and closing valves of hot-water apparatus. July 2, 1883.

3,296. E. M. Loe, London. Window-fastenings. (Com. by W. C. Loe, Paris.) July 3, 1883.

3,309. A. Tylor, London. Apparatus for preventing waste of water in water-closets, &c. July 4, 1883.

3,311. D. G. Cameron, London. Flushing-apparatus. July 4, 1883.

3,315. W. Wade, Crewe. Fire-grates, &c., July 4, 1883.

3,344. A. J. Boult, London. Ventilating casements. (Com. by MM. Bouquet and Bulle, Besançon, France.) July 5, 1883.

NOTICE TO PROCEED

has been given by the following applicants on the dates named:—

July 3, 1883.

1,643. F. J. Biggs, London. Latches and locks. April 2, 1883.

1,728. F. Service, London. Tool for pointing the joints of brickwork. &c. April 5, 1883.

3,191. P. Efferty, London. Brickmaking-machines. June 27, 1883.

July 6, 1883.

1,153. A. Varale, Sheffield. Attaching door-knobs to their spindles. March 3, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

Published during the Week ending July 7, 1883.

5,274. A. M. Clark, London. Means for attaching hat-pegs, curtain-holders, gas-brackets, &c., to walls and ceilings. (Com. by MM. Gollot frères, Paris.) Nov. 4, 1882. Price 2d.

A cylindrical hole is bored in the wall, and the articles are secured by a plug made in section, through the centre of which passes an inclined screwed rod. (*Pro. Pro.*)

5,312. J. Bartlett, London. Gas-stove, for heating water for baths, &c. Nov. 7, 1882. Price 6d.

Inside the casing are a series of helically-twisted tubes, connected at top and bottom to shallow vessels, in which the water is heated.

5,347. R. Crane, London. Smokeless stoves and grates. Nov. 9, 1882. Price 2d.

The grate is in form of a vase, with a hopper on each side to replenish the coal at the bottom. (*Pro. Pro.*)

5,378. R. Plush, London. Means for securing or fastening the sliding-sashes of windows. Nov. 11, 1882. Price 2d.

The locking contrivance is placed in a recess in the window-frame, and secured by lock and key. (*Pro. Pro.*)

5,383. J. J. Tylor, London. Apparatus and arrangements for the water-supply of water-closets, baths, and urinals, and preventing waste of water. Nov. 11, 1882. Price 6d.

The closets, &c., are flushed periodically by an automatic action. The water is allowed to flow slowly into the cistern, and starts a syphon, in the long leg of which is a bend or trap. As this is filled the air in the cap of the syphon is compressed, and the further flow of the water prevented until the cistern is filled above the cap, when the water passes down a stand-pipe to the bend, which is thus filled, starting a small syphon formed therein. The bend is thus emptied, and the compressed air released, when the cistern is entirely emptied. Basins of closets are emptied by a syphon, with a contracted bend.

5,435. C. R. Stevens, Lewisham. Apparatus for heating and ventilating. Nov. 14, 1882. Price 6d.

This is an improvement on Patent No. 1,714, of 1881, in providing the water-heater with a closed tank, connected with the main, from which it is supplied with the water, and in numerous other details, which are shown in thirty-two figures in the drawings.

5,445. J. Wetter, London. Ornamental tiles, or blocks of earthenware. (Com. by J. B. Boulenger, Auneuil, France.) Nov. 10, 1882. Price 4d.

These are made of two different materials pressed together, and ornamented as required, and then burned.

5,447. G. Atkins and E. Atkins, Birmingham. Sliding gaseliers and chandeliers. Nov. 15, 1882. Price 6d.

The supporting chains are coiled round brake blocks. (*Pro. Pro.*)

5,472. S. Hawksworth, Scarborough. Manufacture of pavements or surface-coverings, floor-cloths, wall-coverings, &c. Nov. 17, 1882. Price 4d.

This is an improvement on Patent No. 1,968, of 1874, in preparing the coloured compounds, and mixing them up to imitate marble. The mixture is then cut into sheets, rolled, and impressed upon canvas, &c.

5,642. H. J. Allison, London. Forks or tongs, chiefly for domestic purposes. (Com. by R. W. Turner, Boston, U.S.A.) Nov. 28, 1882. Price 6d.

These consist of a handle, in which is a rod controlled by a spring, and two jaws are pivoted to the end of the rod. When this rod is pressed into the handle the jaws are opened, and *vice versâ*.

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

LIGHT AND AIR CASE.

THE PATENT SILVERING COMPANY *v.* R. H. PADBURY, W. C. WAYRE, AND H. BURMAN.

THIS case was heard before Mr. Justice Stephen, it being contended by the plaintiffs that the erection of a skylight on a yard abutting on their premises had injured the light for their trade. The freeholder of the two properties had in granting a lease to the plaintiffs covenanted to make no erection which should interfere with the light of the premises.

The plaintiffs called several witnesses engaged in the trade to support the injury, and also Mr. J. D. Mathews, surveyor.

For the defendants the witnesses were Messrs. Banister Fletcher, A. Peebles, W. W. Gwyther, and J. Gibson.

Mr. Justice Stephen went to view the premises and the skylight, and on returning gave his verdict for the defendants.

ADMISSIONS TO THE ROYAL ACADEMY OF ARTS.

Upper School.—F. W. Besant, G. E. T. Lawrence, T. Maclaren, G. F. Oakeshott, T. Ward.

Probationers.—Louis Ambler, C. S. Appleton, W. H. Bidlake, Frank Brown, E. A. Coxhead, H. W. Crickmay, W. J. W. Ferguson, T. P. Figgis, H. R. Goodrham, F. C. Hart, John Lord, F. S. Ogilvie, E. C. Pickford, T. B. Rutherford, H. D. Walton, R. W. Williams, G. G. Woodward.

Lower School.—C. H. Aitken, W. Brown, S. R. Clemence, E. L. Condor, A. Crow, G. G. Dawber, R. M. Fell, Frank Fox, C. Littlewood, E. Herbert, C. S. Hornabrook, W. C. Jones, F. W. Lane, Henry Ling, C. E. Mallows, J. C. S. Mummery, A. B. Pite, S. H. Seager, W. E. Symington, W. A. Thompson, J. M. Townsend, W. R. Tucker, H. J. Westell, C. F. E. Yonge.

CHURCH-BUILDING NEWS.

Birtley.—As a first step towards the restoration and improvement of Birtley parish church, North Tynedale, a memorial tower, with spire, from the designs of Mr. A. B. Plummer, of Newcastle, having been presented by a generous donor, is about to be added. The edifice has suffered much in times past, especially in the last century, when plain sashed windows were inserted both in the nave and chancel. The walls of the latter are much decayed, and also the woodwork of the windows and pews, The flooring of the pews is not of boards, but of stone flags, now moss-grown, and, therefore, very cold in winter. The chancel arch is early Norman, built nearly 800 years since, with original abaci and chamfered jambs, as at Eglingham Church; and a great part of the old "Priests Door" is also remaining in the south chancel wall. To effect the much-needed repairs and restoration about 400*l.*, not including the cost of the memorial tower and bell spire, will be required.

Netherthorpe (*Sheffield*).—The Archbishop of York has just consecrated the new church in Hoyle-street, dedicated to St. Anne, the fourth new church promoted by the Sheffield Church Extension Society, which Society, together with the York Diocesan Church Extension Society, has furnished the funds for the building. A mission has for some time been carried on in the populous district of Netherthorpe, in connexion with the parish church, and the contract for the erection, which amounted to 5,000*l.*, was placed in the hands of Mr. James Fidler, of Eckington, who has carried out the work from the designs of Mr. J. D. Webster, architect. The church consists of nave and north and south aisles (with porches at the western end), chancel, vestry, and organ-chamber. The walls are of red brick with stone dressings, and the interior is quite plain, with the exception of the chancel, where plaster is introduced, finished with very simple decoration. Under the large east window is a reredos, with spaces for the Commandments, &c., and having in the centre a painting by Mr. Powell, of Leeds, depicting the Lord's Supper. Accommodation is provided for 650 persons.

DISSENTING CHURCH-BUILDING NEWS.

Holloway, Derbyshire.—Memorial stones of a new Primitive Methodist Chapel were laid at Holloway on Wednesday, the 4th inst. The building is picturesquely situated on the side of the hill with foliage abounding all around, and the architect, Mr. Jno. Wills, of Derby, has designed it after the Old English manner, with timbered gables. It is in close proximity of Leahurst, the residence of Miss Nightingale, and will form a conspicuous feature in one of the most beautiful of Derbyshire valleys. The chapel will seat 250 persons. Mr. B. Askew, of Matlock Bridge, is the contractor.

Old Lenton, Notts.—A new Primitive Methodist Chapel was opened on the 5th inst. It seats 350 adults, and has schoolroom and class-rooms for 200 children. The style is described as "Eleventh Century English," and is carefully treated throughout. Very complete provision is made for opening the class-rooms into schoolroom, and also for the usual modern requirements. The cost of the building is 1,500*l.* The architect is Mr. Councillor Wills, of Derby, and the contractors are Messrs. Savage & Attewell, of Nottingham.

Landyssil, S. Wales.—A new Unitarian Chapel is being erected here after designs by Mr. John Wills, of Derby. It stands on an excellent site. The front will have a mullioned window with twelfth-century tracery, and a tower rises over the porch. The glazing will all be in cathedral rolled glass, and the internal fittings will be of pitch pine. The contractor is Mr. Watkin Davies, of Llandyssil.

Books.

Precious Stones. By A. H. CHURCH, M.A., Oxon. Published for the Committee of Council on Education by Chapman & Hall (Limited).

THIS is a dainty little volume on a subject of universal interest, written by a gentleman who has by his previous works identified his name with the matters of which it treats. He is an enthusiast, and we cannot withhold our sympathy with him in his chagrin at the "dense ignorance" which prevails about precious stones.

This ignorance on the part of the public, however, admits of palliation in face of the sad admission that there are even jewellers who, when asked for a "tourmaline," a "jargoon," a "zircon," or a "phenakite," do not understand what is wanted! Is it possible that the country is in such a state? Seriously, however, this little treatise has interested us exceedingly, and our only complaint is that there is not more of it. The jeweller's and lapidary's art has a glorious history, and has passed through many phases, the leading characteristics of which we should have liked to see touched upon by our author. The chapter on the artistic employment of precious stones is full of useful hints for those who are engaged in this beautiful art, and we cordially endorse the almost angry protest against the senseless modern system of manufacturing the shells of jewelry wholesale, and filling in the cavities with stones chosen at random, or changed to suit unreasoning caprice.

The art of the goldsmith and jeweller will never take its proper rank until we pay less regard to the barbaric quality of mass, and

earn to estimate its value by the thought expended upon design.

The writer shows that the most beautiful jewelry need not be costly, and that colour combinations of exquisite loveliness and variety may be accomplished by the discriminating use of stones which have anything but a high market value.

There is no doubt but that the present nomenclature of colours, as the author observes, is neither ample nor accurate, and the time has arrived when a standard series of hues appropriately named should be constructed; the difficulty of illustrating this unique quality of the precious stones is shown in the only coloured plate in the work, which is almost useless as a representation of the brilliant hues of the stones themselves. The work is copiously illustrated, and the illustrations really elucidate the text. A page of "Bibliographical Notes" gives useful references to works on other branches of the subject, and a most valuable catalogue of the Townshend Collection, now at the South Kensington Museum, completes a charming book.

Draining and Embanking. By JOHN SCOTT. Crosby Lockwood & Co.

THIS is the first volume of a projected series of works intended to treat of scientific land culture in its engineering aspects; and its author is well known as an authority in such matters. The history of land drainage for agricultural purposes, and the reasons which have guided its advocates, are shortly and clearly set out without unnecessary circumlocution, and the best methods to be employed under given conditions of soil, &c., are carefully enumerated. The writer has collected facts and statistics from every available source, and has brought within the compass of a handy volume almost all that it is necessary to know about the draining and embanking of lands. Some of his remarks apply to a wider audience than those who are interested in agricultural engineering, and such sentences as "every spadeful of earth excavated beyond what is actually needful is labour and money wasted," or the shrewd advice to entrust the laying of drain-pipes to a workman paid day's wages, and not engaged on piece-work, may be profitably remembered by all who are concerned with building operations at large. It is a little startling to learn from this work that from one and a half to two millions of acres of land in Great Britain alone have been won from the sea by embanking operations, and it points directly to the fact that much more remains to be won. We cannot look at a map of the coast or the estuaries of our great rivers without being convinced that millions of acres are waiting to be reclaimed, and that while such is the case we should have no idle poor but the infirm. No doubt administrative capacity is needed to organise the work. But there is as little doubt that the work ought to be done. This is old teaching of ours. There is no mention made in this book of the use of concrete for checking the inroads of the sea, and securing the low-lying lands from its ravages. We know, however, that this material is so employed successfully and profitably, and, indeed, the sea-beach would seem to be, of all places, the one where it could be best utilised. Surely this is an omission which a future edition should supply. And this is nearly the only omission we notice in a very interesting and instructive little work.

Tramway Acts of the United Kingdom. Second Edition. By HENRY SUTTON, B.A., assisted by ROBT. A. BENNETT, B.A. Stevens & Sons, Chancery-lane. 1883.

As tramways are being laid or extended, not only in the metropolis, but in every considerable town in the kingdom, this digest of the enactments on the subject, and their application in practice, with its accompanying summary of the principles of tramway rating, cannot fail to be of interest and value to all engaged in such enterprises.

The subject is exhaustively and ably treated, and the book is enriched by copious indexes to determined "cases" and, "a sweet virtue, look you," by an ample table of contents.

The aim has been to give the reader all the available information on the subject of tramways in their legal as distinguished from their engineering aspect, and in this edition it has been brought down to March, 1883.

The Joiner and Cabinet-Maker. Houlston & Sons. 1883. Enlarged edition, with illustrations.

THIS is a book for boys, and a very good one of its kind; it treats in an intelligent fashion of the elementary duties of the joiner's shop, and gives a good many useful rules for the conduct of business and of life, enforced by apposite anecdotes, which have always for moral the policy as well as the propriety of being an industrious apprentice and an honest workman. The illustrations are in outline, and drawn in isometrical perspective, and are not only less expensive in consequence, but more intelligible. Such a work as this will be of benefit to the amateur joiner,—and there are thousands of such; it will help him in many of his needs, and explain the *rationale* of much that without its aid would puzzle him. And if he follow the hints given, there are few demands likely to be made upon his skill which he will not be able to satisfy. As a matter of personal taste, we should have liked to see the ingenuous youth referred to some examples of the excellent joinery of the seventeenth century, of which many examples are extant in every county, rather than that the somewhat slipshod modern system herein advocated. However, it is the modern system, and the object of this little book is, we suppose, to describe things as they are done, and not as they might be done. The description of the tools used by the joiner might be extended with advantage. The work is numbered twenty-one in a very useful series, and we can recommend it to all who require a handy little manual on the simpler forms of the joiner's "mystery."

The Land of Morgan. By G. T. CLARK. Reprinted, with additions and alterations, from the Journal of the Archæological Institute. Whiting & Co. (Lim.), London.

READERS of the *Builder* who have perused the singularly powerful papers on old English castles contributed by the author of "The Land of Morgan," will not need any recommendation of this his latest series of collected memoirs. Indeed, so pre-eminent is he in this special department of historical archæology or archæological history that any encomium becomes almost an impertinence. The amount of research which has gone to make up this small volume of 166 pages is very remarkable, and we have an unfeigned admiration of the literary skill which can succeed in making such an array of names and dates not only readable, but interesting. Macaulay, in his essay on Milton, points out that some of the most musical passages in the "Paradise Lost" are mere catalogues of uncouth names, which the genius of the poet has made pleasing to our ear. Certainly, Mr. Clark has Welsh names to conjure with, and Welsh names are singularly melodious even in the mouth of an alien, and are mellifluousness itself when lisped by a native of the Principality. This work incidentally throws a flood of light on many hitherto obscure points of English history also, and is a very storehouse of facts and hints for those who are working on similar themes. The "Sons of Morgan" have in this writer a warm friend and advocate; he pays a just tribute to their bravery, their zeal for liberty, and to the other virtues of a people who wanted only a just ruler to become loyal subjects, industrious in peace and faithful in war.

This is a book which requires a keen appetite, and, some might say, an acquired taste for its thorough enjoyment; but those who really are interested in the important subject of it cannot fail both to profit by its wisdom and learning, and to enjoy the beauties of its masculine and masterly style.

VARIORUM.

"MEMORIALS of Christchurch, Twynham, Hants," by the late Mackenzie E. C. Walcott, F.S.A., third edition, revised by B. Edmund Ferrey, F.S.A., is the title of a little book published by W. Tucker & Son, Christchurch, and treats of a congenial subject with all the author's accustomed skill. A plan of the church is given, and a photograph of the group, as seen from the river, is prefixed to the volume, which is intended to instruct the inhabitants and visitors in the history and characteristics of this grand old Priory Church, and well fulfils its intention.——"The North East Ports and Bristol Channel," by W. Clark Russell (Andrew Reid, publisher, Newcastle-on-Tyne), is a collection of bright readable essays reprinted from the *Daily Telegraph*, and illustrated by clearly-drawn coloured plans on a good scale, based apparently, in many cases at least, on the Ordnance Survey. The facts set forth as to the increase of such towns as Middlesbrough, for instance, are almost beyond belief, but that there is the town to witness them. The literary adroitness with which they are set out in the most telling form, and that peculiarly modern art of giving life to what would formerly have been a dry enumeration of uninteresting particulars, conspire to make this book as entertaining as a novel, while it is as instructive as an encylopædia.—— Of the "Building Regulations for the Borough, of Leicester" (Tomkin & Shardlow, Leicester) we need only say that they have been prudently compiled, and that happy is the town which has its sanitary matters so well watched and provided for.——"Where to Emigrate: a Handy Guide to the English Colonies for Intending Emigrants" (Wyman & Sons), is, so far as we have been able to test it, complete and trustworthy. It is illustrated by capital maps, and contains an amazing amount of information of all sorts, viz., as to house-rent, clothing, schooling, cost of living, &c., which must be to the advantage of those for whom the book has been written.——"The A B C of Modern Photography," by W. K. Burton, C.E., third and enlarged edition (Piper & Carter, 1883), is the best small work of the kind we have met with, and will be welcome to a wide circle of practical workers in this delightful art. —— "Carpentry," by Robt. Jones, architect, Warrington (*Guardian* Office, Warrington), is a diagram with references, and explains the principle (and practice) of cutting bevels in carpenters' work in roofing, and will be found of service to the intelligent artificer.—— Part I., vol. vii., of the Transactions of the Bristol and Gloucestershire Archæological Society contains a mass of interesting matter and some good illustrations, and notably some papers on the Gloucestershire churches by J. E. K. Cutts, architect, and others; and an account of an old manor-house at Brockworth, which is full of interest to those engaged in the study of our native domestic architecture of the early part of the sixteenth century.—— "Lathe Work," by Paul N. Hasluck, with illustrations (Crosby Lockwood & Co.), is, as its title sets out, a practical treatise, brought down to the present time, and interesting to those even who are not personally concerned with the beautiful art of which it treats. The present is the second edition, and is much enlarged and improved.——Part I. of "Pattern Book for Jewellers and Goldsmiths," published by A. Fischer, London, has reached us, and contains, with, perhaps, one or two exceptions, some really excellent designs and specimens of the goldsmith's art. There is an astonishing number of engravings for the money, all carefully executed, and an example of a very beautiful Roman cup, date *circa* 1200, is alone worth the cost of the Part.—— Of the June magazines *Harper* has a very readable article on "a Famous London Suburb," and a touching record of the ill-fated Chatterton and his associates. The engravings are numerous and good.—— The *Magazine of Art* for June (Cassell & Co.) is excellent, both as to text and illustrations. "A French Cathedral City" is well written and well illustrated, and we owe the editor our thanks for introducing us to the vigorous statue of Peter the Great, which forms one of the illustrations to the very interesting paper "A Sculptor of Heroes." Mr. Pettie's "Water Fly," in the present Academy exhibition, is well translated by the engraver, who has caught the inimitable charm of this painter's work. ——*The Sanitary Engineer* (New York), of which we have spoken well ever since it started, continues to pursue a good course, and must influence in a right direction a considerable number of persons. The numbers of last year, bound as a volume, contain a large amount of information which is permanently valuable.

Appointments: Clerks of Works.—Mr. J. Hindmarch, of Coatham, has been appointed Clerk of the Works for the Middlesbrough Municipal Buildings.—Mr. William Holloway, of Lowestoft, has been appointed Clerk of Works for the new Municipal Offices, Nottingham.

Miscellanea.

Healthy Houses and Sanitary Inspection Societies.—At a meeting held in Newcastle-on-Tyne a few days ago, Professor Fleeming Jenkin lectured on "Healthy Homes." Professor Jenkin, in the course of his lecture, said that in order that a house should be healthy, there should be a free exit for the dirty water of the house, and great care should be taken to have the pipes water-tight and gas-tight. The house should be isolated from the main drain, but that was by no means an easy matter, for traps were not over reliable. They should make quite sure that the public sewers were properly ventilated, but even when that was done the trap might fail, for the water might get free by its own inertia and unseal the trap. In a proper trap that would not occur, but traps were often ill-constructed, and were, therefore, as he had said, not reliable, and in other ways than the one he had mentioned they might fail. Care must be taken that the drinking water was not in danger of being contaminated. The Sanitary Inspection Associations which had been formed in various parts of the country aimed at periodical inspections of the houses of its members by a qualified engineer, with a view to remedying such defects as were of a dangerous character. Experience of such associations hitherto had shown a large number of houses requiring attending to, and it was not sufficient that there should be just the one examination. Examinations should be annual, for traps went wrong and pipes deteriorated in the lapse of time. Where established these societies had worked well and in perfect harmony with the local authorities. Mr. Hugh Lee Pattinson moved, "That we proceed to the formation of a Sanitary Association, to be called 'The North-Eastern Sanitary Inspection Association'; appointing the provisional committee a council of such association, with power to add to their number; and recommending the objects of the association for the consideration and cordial acceptance of the inhabitants of the north-eastern district."

An American Tale.—An amusing story,—in a double sense of the word, we fear,—comes from the United States. A hotel-keeper living at Raleigh, in North Carolina, we are told, recently broke one of his bar-room windows, and being unable to get the damage repaired in his own town, he wrote off to New York for a pane of glass the required size. The measurement was 32 in. by 22 in.; but in his haste Boniface wrote "feet" instead of "inches," and in consequence his order rather astonished the glass-makers of the Empire City. They could not, they soon discovered, manufacture a sheet so large; and, bearing in mind the magnitude and apparent importance of the order, they at once telegraphed to France for what they required. A Paris manufacturer happened to be able to roll a sheet of the necessary superficies, and at the earliest possible moment he did so, and shipped the result to New York. In due time the huge parcel, which, on account of its size, could not be forwarded by rail, reached its destination; and on opening it the hotel-keeper found a mass of glass 1 in. thick and as large as the floor of a banqueting-hall. But, what was still worse, the Paris manufacturer's bill came to more than 3,000 dols.; and the charges for transport and insurance amounted to nearly half as much again. What course Boniface adopted is not stated. Probably he either committed suicide, or made arrangements for exhibiting his purchase to all comers at 50 cents. a head. So far the "story." One reflection that occurs to us as we read it is that Raleigh, in North Carolina, must be a town strangely devoid of the national "go-aheadedness" if it contains no glazier capable of supplying a pane of glass 32 in. by 22 in.

Artisans' Dwellings. — The Industrial Dwellings Company, of which Sir Sydney Waterlow, M.P., is chairman, has acquired from the Metropolitan Board of Works about an acre of land in Soho, having frontages to the new street from Charing Cross to Oxford-street, on which nearly a thousand rooms will be erected. Up to the present time this Company has provided for the accommodation of about 25,000 persons of the working classes in various parts of London. Cannot the Company give their tenants some rooms a little larger than they have done?

The Greek Church, London Wall.—Another of the City places of worship, the Greek Church in London-wall, is now being demolished to make way for blocks of offices, which will be connected with Nos. 50 and 51, Old Broad-street. This church was built about forty years ago in London-wall, which was then in close proximity to the residences of the principal Greek merchants. Following the stream of fashion westward they found their place of worship too far from their residences, and, taking advantage of the large increase in the value of property in London-wall, they sold their leasehold interest in the church to the freeholder for a very large sum, and built for themselves a large and handsome edifice in Bayswater. The site of the old church, together with the sites of Nos. 50 and 51, Old Broad-street, are now being advertised for letting on building leases.

The St. George's (Gloucestershire) School Board have received the following tenders for building new schools at Barton Hill:—

H. A. Forse	£3,580 0 0
J. Gimblett	3,575 0 0
Wilkins & Sons	3.568 0 0
Eastabrook & Sons	3,397 0 0
W. G. Simmons	3,367 0 0
G. Humphrey	3,367 0 0
W. Veals	3,363 0 0
J. E. Davis	3,333 0 0
H. J. Rossiter	3,321 0 0
Saise & Son	3,312 0 0
Lewis & Edbrook	3,289 0 0
W. A. Green	3,252 0 0
J. James	3,180 0 0
W. E. Walters & Son	3,150 0 0

The tender of Messrs. W. E. Walters & Son was accepted. The plans of the school have been prepared by Mr. E. M. Barnes, of Bristol.

Lismore. — The new R.C. Church of St. Cartagh, Lismore, is nearly completed. The church is picturesquely situated at the highest point of the town. The nave and transepts have been roofed in, and the tower is raised some 20 ft. above the nave roof. It is expected that the portion of the church now in hand,—viz., the nave and transepts, including the tower,—will be available for divine service early in August, and there will then remain only the apse, side chapels, and vestry to be completed. The style of the building is Romanesque, of a type not uncommon in North Italy. The design was furnished by Mr. W. G. Doolin, of Dublin, architect, and the works are being carried out under his superintendence. Upwards of 8,000*l.* has already been expended upon the work.

The Employes of Messrs. Palmer & Co., plumbers, of 1A, Canal-road, King's-cross, held their annual dinner at the "Prince George," Brighton, on Saturday last. Mr. J. Bennett proposed the health of "Mr. Samuel Palmer and the Firm." Mr. Palmer replied, returning thanks, with a short address to the men, and complimented them upon the success of the year. Various speeches were made.

Trade Exhibition.—As will be seen in our advertising columns, the first annual Manufacturers' Mediæval, High Art, and Ecclesiastical Furniture and Decorative Exhibition is announced to be held in Humphreys's Hall, Albert Gate, Hyde Park, from the 25th of August to the 8th of September next. As a representative trade exhibition it cannot fail to be interesting to our readers.

TENDERS.

For alterations at The Horse and Groom, Westminster Bridge-road, for Mr. Sewell. Mr. H. I. Newton, architect, 27, Great George-street:—

Axford	£879 0 0
Godden	855 0 0
Langmead & Way	798 0 0
Beal (accepted)	798 0 0
Pewterer's Work.	
Warne	£95 0 0
Davidson	69 15 0
Heath (accepted)	67 0 0

For the erection of three shops in Maple-road, and six cottages in Vineleigh-road, Penge, for Mr. M. Mathew. Mr. R. McKenzie, architect, New Thornton Heath:—

Jas. Smith & Sons, South Norwood	£4,080 0 0
Geo. Masters & Sons, Anerley	3,585 0 0
Jas. Hobbs, Penge (accepted)	2,900 0 0

For the construction of roadway, footpaths, and laying in pipe-sewers, &c. on the Honour Oak Park Estate, for Mr. E. P. Trenchard. Mr. Herbert D. Appleton, The Wool Exchange, architect:—

G. Felton, Kilburn (accepted)	£1,464 0 0

For the erection of St. Paul's Vicarage, Forest Hill, for the Rev. Frank Jones. Messrs. H. D. Appleton & E. W. Mountford, joint architects:—

Howard & Dorrell	£1,846 0 0
Humphreys	1,700 0 0
Turtle & Appleton	1,465 0 0
W. Robinson, Lower Tooting*	1,370 0 0

* Accepted.

For erection of Congregational Chapel at Farnworth, near Bolton. Mr. F. Bartram Payton, architect, Laisteridge-road, Bradford. Quantities by the architect:—

Joseph Munks, Hucknall (accepted)	£2,470 0 0
Neill & Son, Manchester	2,750 8 0
John Taylor, Bolton	2,750 0 0
Norris & Sons, Bolton	2,890 0 0

For erection of Unitarian chapel, Llandyssil. Mr. F. B. Payton, archtiect, Bradford:—
Watkin Davies (accepted) Llandyssil.

For erection of ship chandler's shop, warehouse, offices, &c., for Messrs. F. & T. Ross, Hull. Mr. F. B. Payton, architect, Bradford. Quantities by the architect:—

Benjamin Musgrave, Hull	£1,465 0 0
George Jackson & Son, Hull	1,781 0 0
Joseph Morrells, Hull	1,452 0 0
G. W. Holmes, Hull	1,438 0 0
J. W. Garbutt, Hull	1,410 0 0
Fredk. Blackburn, Hull	1,384 15 0
Executors of Thos. Southern, Hull	1,383 0 0
Thos. Goates, Hull	1,366 0 0
Mark Harper, Hull	1,366 5 6
Robt. Habbershaw & Son, Hull	1,352 0 0
H. Grassby, Hull	1,350 0 0
F. Bedby, Hull	1,335 0 0
John Simpson, Hull	1,318 0 0
John Drury Hull (accepted)	1,324 7 0

For alterations to Primitive Methodist chapel, Milford, Derbyshire. Mr. F. B. Payton, architect, Bradford:—

A. W. Spencer, Derby	£ 37 0 0
H. Kent, Duffield	328 0 0
Wheeldon Bros., Belper	280 0 0
A. Hingley, Duffield	275 0 0
Thos. Dyer, Belper (accepted)	275 0 0

For the erection of a Primitive Methodist chapel, Holloway, near Cromford. Mr. F. B. Payton, architect, Bradford:—

Joseph Walker & Sons, Wirksworth	£725 0 0
Wheeldon Bros., Belper	690 0 0
L. T. Wildgoose, Matlock Bank	679 0 0
Wm. Askew, Matlock Bridge (accepted)	640 0 0

For the erection of the new Rochester and County Club House at Rochester, Kent, for Mr. C. Arckoll. Mr. G. Friend, Maidstone, architect. Quantities by Messrs. Curtis & Sons:—

Patman & Fotheringham	£3,710 0 0
Wills	3,508 0 0
Denne	3,497 0 0
Foster & Dicksee	3,325 0 0
Kirk & Randall, Woolwich	3,270 0 0
Calland	3,240 0 0
Blake	3,200 0 0
Naylar	2,993 0 0

For the erection of the Rochester and County Club, the Castle Gardens, Rochester. Mr. Geo. Friend, Maidstone, architect:—

Pitman & Fotheringham, London	£3,718 0 0
Wiles, Dover	3,508 0 0
W. T. Denne, Walmer	3,497 0 0
Foster & Dicksee, Rugby	3,325 0 0
Kirk & Randall, Woolwich	3,270 0 0
Callund & Son, Rochester	3,240 0 0
Blake, Sevenoaks	3,200 0 0
Naylor & Son, Rochester	2,993 0 0

For new shop and premises, Marlowes, Hemel Hempstead, for Mr. Chas. E. Gray. Mr. W. A. Fisher, Hemel Hempstead, architect:—

Horn, Hemel Hempstead	£1,399 5 6
Sear, Hemel Hempstead	1,355 0 0
Monk, Hemel Hempstead	1,350 0 0
Fincher, Tring	1,298 10 0
Waterman, Watford	1,298 0 0
Martin, Wells, & Co., Aldershot and London (accepted)	1,290 0 0

For semi-detached house and cottage at Bury Mill End, Hemel Hempstead, Herts, for Mr. W. E. Bailey. Mr. W. A. Fisher, architect:—

Horne, Hemel Hempstead	£635 0 0
Sear, Hemel Hempstead	626 10 0
Kitchener, Hemel Hempstead	574 0 0
Monk, Hemel Hempstead	548 0 0

For new minister's house for the Trustees of Boxmoor Baptist Chapel, Hemel Hempstead, Herts. Mr. W. A. Fisher, architect:—

Nash, Berkhampstead	£750 0 0
Sear, Hemel Hempstead	662 0 0

For supplying and laying a 3-inch cast-iron water main from Bromborough to Eastham and Childer Thornton, together with the necessary meters, valves, hydrants, and other fittings. Mr. Charles H. Beloe, M. Inst. C.E., 13, Harrington-street, Liverpool, engineer. Quantities supplied:—

Geo. Hall, Liverpool	£1,611 0 0
Laurence Hardman, Rock Ferry	1,457 0 3
Geo. Day, Liverpool	1,450 0 0
Williams & Co., Liverpool	1,374 19 3
Fawkes Bros., Birkdale	1,265 7 8
R. B. Mackinnon, Liverpool	1,172 9 11
Jackson, Neston	1,165 0 0
E. Taylor, Hoylake	1,132 16 0
William Winnard, Wigan (accepted)	1,070 4 8

For the erection of a house in the Honor Oak-road, for Mr. Courtney Hallett. Mr. Herbert D. Appleton, architect, 157, Wool Exchange:—

W. Robinson, Lower Tooting (accepted)	£1,200 0 0

For painting, distempering, and other work at the Poplar and Stepney Sick Asylum, Devon's-road, Bromley-by-Bow, for the Managers. Messrs. A. & C. Harston, 15, Leadenhall-street, architects:—

Gibbin, Bayswater (accepted)	£336 0 0

For painting and other work at the Chelsea Infirmary, Vale-street, Chelsea, for the Guardians of St. Luke's, Chelsea. Messrs. A. & C. Harston, 15, Leadenhall-street, architects:—

Derby, Limehouse (accepted)	£157 0 0

For erection of shop on forecourt, and stables, stores, &c., in rear of premises, Burnt Ash-lane, Lee, for Mr. W. Brown:—

Kennard Bros. (accepted)	£1,250 0 0

For the erection of an iron roof, Spitalfields Market. Mr. Henry Lovegrove, surveyor:—

Croggon & Co.	£4,300	0	0 !
Clark, Bunnett, & Co.	3,750	0	0
The Tees Side Iron and Engine Works Company	3,068	13	2
Thomas Potter & Sons	2 980	0	0
Newton, Chambers, & Co.	2,951	0	0
The Butterley Company	2,833	0	0
The Horsely Company	2,800	0	0
H. Young & Co.	2,756	0	0
William Whitford & Co.	2,751	0	0
William Jones	2,734	0	0
Matthew T. Shaw & Co.	2,575	0	0
Jukes, Coulson, Stokes, & Co.	2,520	0	0
Goddard & Massey	2,488	10	0
Chas. Williams & Co.	2,425	0	0 !

For new 12-in. pipe sewer, manholes, gullies, and air-shafts, in Sewell-road, York-road, Battersea, for Mr. James Churchyard. Mr. Henry John Hansom, surveyor:—

R. & G. Neal	£273	0	0
Richens & Mount	273	0	0
J. King	268	10	0

Accepted for Cloverley Lodge, Llandudno. B. Nelson, architect. Quantities supplied:—

W. Gradwell, Abel Roberts, and Pritchard & Hughes (total)	£872	0	0

For diversion of parish road, Llanddoget Estate, Llanrwst. Mr. B. Nelson, surveyor, Llandudno:—

W. Griffiths, Llanrwst	£730	0	0
E. Jones, Bettys-y-Coed	645	0	0
J. B. Jones, Llanrwst	610	0	0
E. Brooks, Llandudno (accepted)	470	0	0

For stables and cottages, Church-street, Croydon, for Mr. John Thrift. Mr. Robert Ridge, architect, Croydon:—

Waller	£1,350	0	0
Loe & Son	1,265	0	0
Hyde	1,174	0	0
Maides & Harper	1,125	0	0
Pearce	1,095	0	0
Stagg	1,090	0	0
Lambourne	1,033	0	0
White	1,028	0	0
Legg	1,000	0	0
Smith & Bulled (accepted)	995	0	0
Bullock (too late)	945	0	0

For alterations and additions to premises, High-street, South Norwood. Mr. Robert Ridge, architect:—

Smith & Son	£333	0	0
Wyatt	307	0	0
Bryan	292	0	0
Bowyer	283	0	0

For alterations and repairs to the Crown Hotel and stables, Ringwood, for Messrs. Eldridge, Pope, & Co. Messrs. Kemp-Welch & Pinder, architects, Bournemouth:—

A. H. Stroud, Bournemouth	£826	0	0
W. Stanley, Bournemouth	818	0	0
A. Head, Ringwood	798	0	0
Tuck & Carley, Ringwood	748	0	0
W. E. Alexander (accepted)	740	0	0

For building one entire block of the proposed new additional houses at the Royal National Hospital for Consumption, Ventnor. Mr. Hellyer, architect. Quantities supplied by Mr. H. P. Foster:—

J. Jolliffe, Bonchurch	£5,845	0	0
J. Hayden, Sandown	5,200	0	0
J. Meader, Ryde	5,200	0	0
J. Ball, Cowes	4,830	14	0
J. Burton, Ryde	4,640	0	0
Ingram & Son, Ventnor	4,500	0	0

For sewering, metalling, kerbing, and paving, roads on Lords Land Estate, Colchester, for the Corporation of Colchester:—

D. Knight, London	£1,286	0	0
W. Wood, Chelmsford	1,220	0	0
F. Dupont, Colchester	1,192	0	0
G. Dobson, Colchester	1,187	0	0
Everett & Sons, Colchester	1,150	0	0
C. H. Oldridge, Colchester (accepted)	1,137	0	0

For sewering, metalling, kerbing, and paving Stanwell-road, for the Corporation of Colchester:—

D. Knight, London	£395	0	0
A. Chambers, Colchester	376	0	0
W. Wood, Chelmsford	370	0	0
J. Ward, Colchester	368	0	0
Everett & Sons, Colchester	355	0	0
G. Dobson, Colchester	354	0	0
C. H. Oldridge, Colchester (accepted)	338	0	0

For the erection of farm buildings at Upper Marden, for Admiral Sir Geoffrey T. P. Hornby, K.C.B. Mr. James Newman, architect, Sandown:—

W. Irish	£387	12	0
G. Stallard	375	0	0
G. Blackmore (accepted)	352	10	0

For the erection of a manager's cottage for the Shanklin Gas Company (Limited). Mr. James Newman, architect, Sandown:—

W. Newman	£445	0	0
C. H. Young	444	0	0
G. Hayles	410	0	0
A. Newnham	398	0	0
J. White	389	10	0
F. Cooper (accepted)	350	0	0
W. Toomer	337	0	0

For alterations at the Town Hall, for the Sandown Local Board. Mr. James Newman, C.E., Town Surveyor:—

W. Attrill	£98	10	0
J. Reed	89	10	0

For lime store, and other works, for the Sandown Gas and Coke Company (Limited). Mr. James Newman, C.E., Sandown:—

J. Hayden	£110	0	0
W. Jolliffe	90	0	0
F. Colenutt	75	0	0
A. Young (accepted)	65	0	0

For building boys' schools, and additions to infants' class-room, for the St. Nicholas School Committee, King's Lynn. Messrs. W. Adams & Son, architects:—

J. Chilvers, Snettisham	£740	0	0
W. H. Brown, King's Lynn	730	0	0
Bardell Bros.	710	0	0
J. Leach	679	0	0
Foreman & Jarvis	651	0	0
P. H. Dawes (accepted)	599	0	0

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G. & F. D. (let us know when).—J. L. (declined with thanks).—H. H. C.—G. F.—J. C.—R. B. & Son.—J. C.—H. P. F.—Zeno.—M. L. C.—S. P.—R. R. B.—W. A. F.—R. R.—R. Mc K.—S. F. C.—J. G. A.—C. W.—H. W. B.—C. S. J.—H. J. H.—K. Bros.—H. I. N.—C. W. H.—A. & Son.—E. W.—H. & R.—C. & P.—R.—Country Architect.—R. C.—G. W. L.—M. & S.—C. H. C.—D. J. B.—J. R.—H. H.—B. F.—E. F. A.—J. B.—J. T. B.—G. A. (it would not apply at Sunderland).—T. B. & Co. (next week).

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